

Gender Inequalities in Access to Tuberculosis Services in South Africa

Mina Haji

HJXMIN001

A mini-dissertation submitted to the University of Cape Town in partial fulfilment of the requirements for the Master of Public Health (Health Economics) degree.

Faculty of Health Sciences

UNIVERSITY OF CAPE TOWN

January 2019

Supervisor: Dr. Susan Cleary

Associate Professor

Health Economics Division, University of Cape Town (UCT)

The copyright of this thesis vests in the author. No quotation from it or information derived from it is to be published without full acknowledgement of the source. The thesis is to be used for private study or non-commercial research purposes only.

Published by the University of Cape Town (UCT) in terms of the non-exclusive license granted to UCT by the author.

DECLARATION

I, ***Mina Haji***, hereby declare that the work on which this dissertation/thesis is based is my original work (except where acknowledgements indicate otherwise) and that neither the whole work nor any part of it has been, is being, or is to be submitted for another degree in this or any other university.

I empower the university to reproduce for the purpose of research either the whole or any portion of the contents in any manner whatsoever.

Signature:

Signed by candidate

Date: 21/01/2019

DEDICATION

I wholeheartedly dedicate my dissertation work to my family and friends who have always loved me unconditionally and have been a constant source of encouragement during my studies.

ACKNOWLEDGEMENTS

I would like to express my deepest gratitude to my supervisor: Dr. Susan Cleary for her expertise, dedication, keen interest, and continuous guidance at all stages of writing this thesis.

I would like to express my sincere gratitude and appreciation to the REACH (Researching Equity in Access to Health Care) research team, especially those who were involved in methods development and data collection and to the health workers as well as patients who participated in the REACH project.

I would also like to express my sincere thanks to all the academic and administrative staff at Health Economics Unit for all their support and kindness.

Finally, I wish to express my sincere thanks to my family and friends for their never ending support.

ABSTRACT

Tuberculosis (TB) is the leading natural cause of mortality in South Africa, and the country has the sixth-highest TB burden in the world. Of every 100 000 South Africans, 781 are expected to develop TB. Even with the adoption of the Directly Observed Treatment, Short-Course (DOTS) strategy since 1996 and substantial investments and improvement in TB control, South Africa has failed to meet the TB-related targets set by the World Health Organization (WHO). The current burden of TB will lead to massive consequences of mortality and morbidity in the country besides the substantial financial implications for the health system. Considering the infectious nature of TB as a communicable disease, for the sake of controlling the level and spread of the disease as well as preventing drug resistance, adherence to treatment is essential. Moreover, the burden of non-adherence to TB treatment has been affirmed as one of the primary challenges facing global control of TB pandemic. The accessibility of needed care influences the adherence to treatment and in a situation in which non-adherence is the consequence of unjust and avoidable forces, the equity issue inflates its importance. Both barriers and facilitating factors to access and adherence to TB treatment are affected by different social determinants of health, inclusive of gender.

Generally, the gender aspects of access to TB services have been an overlooked research area, and insufficient attention has been given to this aspect of TB control; although a number of previous studies, which had attempted to examine the association between gender and access barriers to TB treatment in different contexts, reported gender as a crucial factor in access to TB services. Hence, this dissertation aimed to explore the gender-based inequalities in access and adherence to TB services in South Africa, from the perspective of TB patients.

This study relies on data drawn from the Researching Equity in Access to Health Care (REACH) project. Applying a comprehensive framework of access, interviews were conducted with 1229 TB patients from four health sub-districts in South Africa, to assess gender-related inequalities across the access dimensions of affordability, acceptability and availability of TB services. Descriptive statistics were computed, and comparisons of access barriers and adherence between men and women were explored using multivariate linear and logistic regressions. Based on the results, there was no significant association between levels of adherence and gender (all p -values > 0.05). Among availability-related variables, men spent significantly less time at the clinic to fetch TB medication (coefficient, -7.06; 95% CI, [-13.5, -0.7]); however with regards to affordability-related variables, men were significantly less likely to receive a disability grant (AOR, 0.48; 95% CI, [0.36, 0.63]), and among acceptability-related variables men were significantly less likely to judge the length of queues to be too long or the cleanliness of the facility to be sub-standard (AOR, 0.69; 95% CI, [0.52, 0.91], and AOR, 0.67; 95% CI, [0.46, 0.97], respectively). Overall, our findings suggest that there is no association between the level of adherence to TB-treatment and gender. Moreover, there was no evidence of systematic gender-based disparities in access to TB services. However, the findings reveal concerns about the condition and cleanliness of health facilities that may impact the patients' adherence and be a barrier, specifically, in women's use of TB services.

Table of Contents

| | |
|--|-----------|
| PART A: RESEARCH PROTOCOL | 1 |
| Background | 2 |
| Introduction | 2 |
| The concept of health equity as a global challenge | 2 |
| Gender inequity in health | 4 |
| Tuberculosis – the global landscape | 6 |
| South Africa: general overview | 9 |
| South Africa – health status indicators | 11 |
| Tuberculosis in South Africa | 15 |
| South Africa's national response to Tuberculosis | 17 |
| Literature review | 19 |
| Introduction | 19 |
| The concept of adherence | 19 |
| Adherence to Tuberculosis treatment | 20 |
| Factors affecting adherence to Tuberculosis treatment | 20 |
| Acceptability | 21 |
| Availability | 23 |
| Affordability | 24 |
| Problem statement | 26 |
| Justification | 28 |
| Research question | 28 |
| Objectives | 28 |
| Conceptual framework | 29 |
| Methods and analysis | 29 |
| Data source | 29 |
| Study setting | 29 |
| Sampling of TB service users and health facilities | 30 |
| Data collection | 31 |
| Data analysis | 32 |
| Limitation of the study | 34 |
| Bibliography | 35 |
| PART B: LITERATURE REVIEW | 44 |
| Introduction | 45 |
| South African health sector and the challenge of equity | 45 |
| The public health care sector | 48 |
| The private health care sector | 49 |
| Health care financing in South Africa | 51 |
| Equity in health | 52 |
| Equity in health care services | 55 |
| Access to health care services | 56 |
| Three dimensions of access and implications for equity | 61 |
| Acceptability | 61 |
| The matter of fit between 'professional health beliefs' and 'lay health beliefs' | 62 |
| Patient-provider dialogue and engagement | 63 |
| Health literacy and stigma | 65 |
| Affordability | 66 |

| | |
|---|-----------|
| Direct and indirect costs of illness | 67 |
| Coping strategies and ability-to-pay | 69 |
| Ill-health and poverty | 71 |
| Availability | 71 |
| Conclusion | 74 |
| Bibliography | 75 |
| PART C: JOURNAL MANUSCRIPT | 81 |
| Bibliography | 92 |
| PART D: POLICY BRIEF | 94 |
| Bibliography | 98 |
| PART E: APPENDICES | 99 |
| Appendix A: Patient Exit Interview Questionnaire for TB tracer, adopted from REACH report | 100 |
| Appendix B: Record Review of TB Services, adopted from REACH project | 114 |
| Appendix C: Ethical approval of current research | 120 |
| Appendix D: Ethical approval of REACH research..... | 121 |
| Appendix E: Journal instructions for authors | 123 |

List of Figures:

| | |
|---|----|
| PART A: Figure 1. Geographic location of REACH sites | 30 |
| PART A: Figure 2. REACH Conceptual Framework | 31 |
| PART B: Figure 1. Access evaluation framework | 61 |
| PART B: Figure 2. Clarified diagram of essential issues connecting to the economic consequences of ill health | 67 |
| PART C: Figure 1. Time commitments associated with using TB services in different adherence levels | 89 |
| PART D: Figure 1. Time commitments associated with using TB services in different adherence levels | 97 |

List of Tables:

| | |
|---|----|
| PART C: Table 1. Characteristics of TB users, in total and by sex | 85 |
| PART C: Table 2. Access and adherence, by sex | 87 |
| PART C: Table 3. Access and gender, at different adherence levels | 88 |

LIST OF ABBREVIATIONS

| | |
|----------|---|
| TB | Tuberculosis |
| DOTS | Directly Observed Treatment-Short Course |
| WHO | World Health Organization |
| HDI | Human Development Index |
| GII | Gender Inequality Index |
| GCI | Global Competitive Index |
| HIV/AIDS | Human Immunodeficiency Virus/ Acquired Immune Deficiency Syndrome |
| UHC | Universal Health Coverage |
| MDR-TB | Multi-Drug Resistant Tuberculosis |
| XDR-TB | Extremely Drug Resistant Tuberculosis |
| MDGs | Millennium Development Goals |
| SDGs | Sustainable Development Goals |
| PPP | Purchasing Power Parity |
| LMICs | low- and middle-income countries |
| IMR | Infant Mortality Rate |
| ART | Antiretroviral Therapy |
| THE | Total Health Expenditure |
| NSP | National Strategic Plan |
| NCDs | Non-communicable Diseases |
| CVDs | Cardiovascular Diseases |
| NTCP | National Tuberculosis Control Programme |
| PHC | primary health care |
| DS-TB | Drug-susceptible Tuberculosis |
| DST | Drug Susceptibility Testing |
| REACH | Researching Equity in Access to Health Care |
| PPS | Probability Proportional to Size |
| MCA | Multiple Correspondence Analysis |
| SES | Socioeconomic Status |
| OOP | Out-of-Pocket |
| ANC | African National Congress |
| NDoH | National Department of Health |
| GHE | Government Health Expenditure |
| MBP | Minimum Benefits Package |
| STIs | Sexually Transmitted Infections |
| COI | Economic Cost of Illness |

PART A: RESEARCH PROTOCOL

Background

Introduction

Tuberculosis (TB) - an old disease that has distressed the human race for more than 4 000 years - remains a pressing public health concern (Zaman, 2010; Krishnan *et al.*, 2014). In South Africa regardless of applying the Directly Observed Treatment, Short-Course (DOTS) strategy since 1996 and substantial investments and enhancements in TB control, the case detection rate is still far from the goals defined by the World Health Organization (WHO). With 450 000 new TB infections annually, TB is anticipated to bring many repercussions on both mortality and morbidity of South Africans along with enormous financial consequences for the health system (Foster *et al.*, 2015; SANAC, 2017). The burden of non-adherence to TB treatment has been affirmed as one of the primary challenges facing global control of TB pandemic (Van den Boogaard *et al.*, 2011). In a situation where non-adherence to treatment is the consequence of unjust and avoidable forces, equity issue inflates its significance. Although TB services are free at the point of use in South African public health facilities, much is unknown about overall barriers in access to TB services and their association with treatment adherence. Gender, as a social determinant of health, has been reported to impact the access and adherence to TB services in other settings, while gender-related barriers to TB access have been an under-researched area in South Africa. This study aims to explore these barriers as well as the gender-based differences of perceived barriers from the perspective of TB patients who enrolled in DOTS in South Africa. The following section introduces the overall methodological approach to the study. It represents the study design, the study setting and data sources in addition to the methods used in data analysis.

The Concept of Health Equity as a Global Challenge

Health inequalities are much-discussed issues in current health policy landscape, where massive inequalities in health within and between communities, societies, and geographical regions are debated as a significant challenge to the world (Marmot, 2005; Coburn, 2007; Ong *et al.*, 2009). The matter of addressing health inequalities was first expressed in 1978 at the World Health Organization's Alma Ata Declaration (Ong *et al.*, 2009; WHO, 2015). The concern for immediate action to advance the health of all citizens of the world through governments' policies, health and development workers' actions, and the world community was voiced within the declaration

(WHO, 2015). In 1980, all member states of the World Health Organization (WHO) European Region agreed on a joint health policy by which the first target was involved in equity: “By the year 2000, the principal target of WHO as well as governments is to provide a level of health which will allow all the people of the world to lead a productive life, both economically and socially” (WHO, 1985; Whitehead, 1991, p.3). Equity is an ethical concept which means social fairness and is rooted in principles of distributive justice (Braveman and Gruskin, 2003). According to WHO definitions, there is a considerable difference between inequality and inequity in health. The term inequity is assigned to disparities in health which are not merely unfair and unjust but are unnecessary and avoidable as well (Whitehead, 1991), while health inequalities either are related to biological differences and free choices or they are attributed to the external environment and conditions which are not controllable by individuals. In the case of biological-related differences, the health inequalities are unavoidable; and it is impossible or unacceptable, either ethically or ideologically to change these; while in terms of environmental-related inequalities the uneven distributions might be unnecessary and avoidable, consequently the rising health inequalities also breed inequity in health (Kawachi *et al.*, 2002).

In the light of the nature of equality, it is noteworthy that equality in health is an essential reference point in endeavours to achieve greater equity in health. Particularly given that health inequalities are extensive and often influence the social group who are already deprived (for instance, on account of being poor, women, or members of a disenfranchised religious, racial, or ethnic group) (Braveman and Gruskin, 2003; Ong *et al.*, 2009). Evidence shows that higher premature mortality rates, suffering from a higher burden of disease as well as lower survival chances, higher burdens and earlier onset of diseases along with increased disability among certain groups are in existence all around the world, across various social as well as political systems (Whitehead, 1991). While health is crucial to welfare and to overcoming other effects of social disadvantages, health inequalities consistently put groups of people who are already socially deprived at a further disadvantage by virtue of their health. For example, with respect to out-of-pocket (OOP) payments, the poor are forced into spending large amounts of their restricted incomes on health care, and they may end up with deficient resources to shelter and feed themselves (Braveman and Gruskin, 2003; O’Donnell *et al.*, 2008).

Since the 1980s, health equity has become a progressively favoured research topic in health field so that by the end of the 1990s, many policymakers, governments, nongovernmental organizations (NGOs), donors, and international organizations had put equity in health care at the top of their health-related agendas (O'Donnell *et al.*, 2008). In the last few years, with regard to emergence of interest in broad-based, context-specific primary health care as well as universal health coverage (UHC), tagging equity in health and access to health services have been counted as an encompassing goal for health systems across the globe (Ong *et al.*, 2009; Gauld *et al.*, 2012). In the face of all challenges, the ray of hope exists in the capacity of carefully designed and managed health systems which are capable of improving health equities through providing improved financial, cultural and physical access. Equitable health systems offer various benefits to society, such as broader life security and well-being as well as the assurance of care during the sickness period (Gilson *et al.*, 2007).

Gender Inequity in Health

Gender inequality and inequity are among the basic structures of social hierarchy which inform how people are born, grow, live, and die. Gender is a powerful determinant of nearly all health outcomes. Gender inequalities in health, which hurt the health of women and girls all around the world are related to the fact that women endure nonfatal, disabling physical and mental diseases more than men, so despite having longer life expectancy, women are more likely to live fewer years in good health (Sen *et al.*, 2007; Borrell *et al.*, 2014). Even though gender inequality gives men substantial benefits over assets, power, and authority, it can damage men's overall health, as these advantages come with a cost to their mental and emotional health that are related to risky behaviours and decreased life expectancy (Sen *et al.*, 2007).

Gender differences in health differ in magnitude across various health states. Several health conditions are driven mainly by biological sex¹ differences while others are the consequence of socialising women and men into gender roles supported by masculine and feminine norms, and advantages that power relations give to men, that negatively affect the health of both genders.

¹ "Sex" is a biological construct inferred from biological characteristics implementing sexual reproduction while "Gender" attributes to a social construct respecting culture-bound roles, conventions, and behaviours for, along with relations between, boys and girls as well as women and men (Krieger, 2003) .

Numerous health conditions reflect a consolidation of gendered social determinants along with biological sex differences. In order to understand this different exposure and vulnerability, considering the roles of biological difference and social bias is crucial (Denton *et al.*, 2004; Sen *et al.*, 2007).

Gender relations, as experienced in everyday life and the daily business of well-being or ill-being, are founded on basic structures that govern how power is rooted in the social hierarchy. Gender relations of power, which are disparate, complex, and framed in history, lead to the root causes of gender inequality and are amongst the most important social determinants of health (Sen and Östlin, 2008; Marmot *et al.*, 2012). These relations ascertain if health needs are recognised, whether people have control over their lives and health condition, and whether they can claim their rights (Sen and Östlin, 2008). In order to describe gender power relations, various forms of discrimination and bias along with consequent injustice and inequalities should be considered. In other fields aside from health, the concept of gender equality has been used as a basis for notions of “gender justice” and “gender equity”; in such cases according to the extent that inequalities between women and men are the product of social power relations, they are likely to be innately unfair and biased. However, as a result of the confounding effect of biology, the same position is barely held within the field of health. Additionally, inequality of health outcomes can be a sign of gender injustice, since it may demonstrate that women's biology-specific needs are not sufficiently recognised. Therefore, gender equity in health is not solely premised on uniformity but stands precisely on the basis of the absence of bias (Sen *et al.*, 2007).

Gender systems have various features that are different across distinct societies. The concept of gender also intersects with racial and ethnic hierarchy, economic inequalities, disparities based on sexual orientation, and several other social tags. Women may own inferior land, affluence and possessions in nearly all societies; nevertheless, bear higher burdens of work with regards to ensuring the survival, reproduction and security of other household members while the majority of this workload is imperceptible in economic commentaries (Dijkstra and Hanmer, 2000; Sen and Östlin, 2008).

Cultural beliefs, norms of behaviour, and laws preserve Women's status as lower beings and second-ranked citizens, in many societies. On the other hand, men generally enjoy greater wealth, jobs of higher status, better education, greater political power, and less behavioural restrictions (Dijkstra and Hanmer, 2000). Moreover, in different parts of the world, men exercise power over women; they make decisions on behalf of women, also control their access to resources, and influence their behaviour through socially endorsed violence. However, not all men exercise power over all women; gender power relations intersect with age as well as the other social stratifiers inclusive of race, class, and ethnicity. Comprehensively, physical and psychological health of girls, women, transgender/intersex people, as well as boys and men can be affected by gender power relations (Sen and Östlin, 2008; Lee and Sadana, 2011).

Gender systems, structural processes and their interaction, simultaneously establish the gendered structural determinants of health. The interaction between gender systems and structural processes such as improving literacy and education, demographic change in rates of birth and death, globalisation (including its effects on labour forces, policy space, health systems, and violence), and enhancing human rights aims to change the effects of gender hierarchies on people's health (Sen and Östlin, 2008; Macpherson *et al.*, 2012).

Tuberculosis – The Global Landscape

Worldwide, TB is the dominant cause of death from a single infectious agent. TB infection, as an endemic airborne infectious disease, is transmitted through interaction between exposed individuals and infective sources within enabling socio-environmental contexts. As an airborne pathogen, the transmission probability of TB is driven by the volume of air inhaled from an infected source and the concentration of *Mycobacterium tuberculosis*-containing breathable particles (doses) per volume of air (Issarow *et al.*, 2015; 2018). In 2016, based on WHO estimates, 1.3 million TB deaths among HIV-negative¹ people and approximately 374 000 deaths among HIV-positive people were reported. Of the estimated 10.4 million incident cases, most occurred in the WHO South-East Asia Region (45%), the WHO African Region (25%), and the WHO Western Pacific Region (17%); while the WHO Eastern Mediterranean Region (7%), the WHO European

¹ Human Immunodeficiency Virus

Region (3%) along with the WHO Region of the Americas (3%) had the fewest cases of TB (WHO, 2017b). From the reported statistics 35% were female, 90% were adults, and 10% (74% in Africa) were HIV infected people (Ankrah *et al.*, 2017; WHO, 2017b). According to the WHO (2017), in several countries, there is a gap between the statistics on notified TB cases and TB incidence due to under-diagnosis in conjunction with underreporting of TB cases in those settings, while in countries with ultramodern national surveillance systems almost all the new TB cases are diagnosed and registered. In order to quantify the underreporting level and provide an acceptable proxy for TB incidence, national TB inventory studies can be used (WHO, 2017b).

Currently, drug-resistant TB (DR-TB) is a significant public health concern in many countries. Globally, three groups of DR-TB are used in observation and treatment: rifampicin-resistant TB (RR-TB), multi-drug resistant TB (MDR-TB) and extremely drug-resistant TB (XDR-TB). RR-TB and MDR-TB require therapy with a second-line¹ regimen while MDR-TB is resistant to most powerful anti TB drugs: rifampicin and isoniazid (WHO, 2016b). Extensively drug-resistant TB (XDR-TB) is in MDR-TB category which is resistance to the two most important classes of medicines in an MDR-TB regimen: at least one fluoroquinolone, and a second-line injectable agent (amikacin, capreomycin or kanamycin)(WHO, 2017b).

Since 1993, when tuberculosis was recognised as a worldwide public health problem, WHO launched the DOTS strategy, to improve patient adherence (Lawn and Zumla, 2011). International goals for reducing the epidemiological burden of TB had been set for 2015 and 2050 in the framework of the Millennium Development Goals (MDGs) along with the Stop TB Partnership (Glaziou *et al.*, 2015). DOTS - by focusing principally on detection as well as effective treatment of infected cases - was the dominant strategy through which the Global Plan to Stop TB and WHO's Stop TB Campaign were designed to lead national TB policies to reach the TB-related MDGs. The set target was lowering prevalence and TB-related mortality by 50% between 1990 and 2015, and reversing the rising TB incidence rates (Lawn and Zumla, 2011). The DOTS strategy was relying on five essential constituents: (1) government promptness concerning consistent TB

¹ Some of the TB drugs, known as first-line TB drugs, are merely prescribed for the treatment of new patients who are improbable to have resistance to any of the TB medications. On the other hand, the second-line TB drugs are only used for the treatment of DR-TB (WHO, 2010).

control operations; (2) diagnosis of TB cases among symptomatic patients throughout sputum smear microscopy; (3) a standardised directly observed treatment (DOT) regimen for all detected sputum smear-positive cases; (4) perpetual supply of TB drugs and; (5) a standardised monitoring system that allows evaluation of treatment results for TB patients as well as the TB control programme (WHO, 1999; Uplekar and World Health Organisation, 2006). Although the social consequences and the costs (direct and indirect) of TB are catastrophic for patients, their families, and community on a broader scale, TB treatment is reported as one of the most cost-effective interventions which can reduce transmission if applied early in the disease course. Moreover, it has the potential to generate economic benefits that are ten times the level of health care investment (Laxminarayan *et al.*, 2009; Lönnroth *et al.*, 2010; Hargreaves *et al.*, 2011).

The successes of the DOTS strategy should not be overlooked. During 1995-2008, 43 million people received TB treatment under DOTS, and 36 million were cured. The rate of TB case detection increased about six-fold globally, and the rate of case-fatality halved from 8% to 4%. In 2006, after one decade of DOTS implementation, the new Stop TB Strategy and the Global Plan to Stop TB were introduced to tackle critical challenges concerning TB control (Lawn and Zumla, 2011). In 2015, based on WHO tuberculosis report, the MDG 6 goal of halting and reversing TB incidence had been reached on a global basis, in 16 of 22 high-burden settings which accounted for about 80% of TB cases. Moreover, the global rate of TB incidence had decreased by an average of 1.5% per year since 2000 and was 18% lower than the level of 2000. However, the reported global total number of TB cases in 2015 was higher than the previous years which reflected an improvement in national data rather an actual increase in disease burden (WHO, 2015). Despite all these achievements, TB incidence was not falling fast enough to reach future targets, and global investments and activities were insufficient to end the global TB epidemic. Hence, TB remained as one of the dominant causes of death globally (Raviglione and Sulis, 2016; WHO, 2016a). Two thousand fifteen was the year of conversion of the Stop TB Strategy to the End TB Strategy and also of the MDGs to a new stage of Sustainable Development Goals (SDGs) (WHO, 2015). Three high-level indicators of the End TB Strategy are as follows: (1) the absolute number of TB death; (2) the TB incidence rate; and (3) the proportion of TB patients who experience catastrophic costs which are caused by TB disease. Years 2030 and 2035 have been set as targets

for these indicators along with the years 2020 and 2025 as milestones, while the target set for 2020 is 20% reduction in TB incidence and 35% decrease in the absolute number of TB-related death (WHO, 2016a).

Controlling the TB pandemic encounters a number of setbacks, mainly inclusive of: (1) the HIV-TB co-infection; (2) the emergence of the MDR-TB; (3) high number of unknown TB cases as a result of weak health systems, which can be responsible for continuous TB transmission; (4) insufficient financial resources and; (5) lack of adequate intensified research on new diagnostics, medications and preventive interventions (Raviglione and Sulis, 2016).

South Africa: General Overview

The history of South Africa is permeated with discrimination on the basis of gender and race. Since April 1994, after democratization of South Africa, the elected government has taken a number of steps with regard to reversing the consequences of apartheid legacy that was mostly described by extreme unjustified inequalities in health and other development policies that were unevenly focused on securing the white population's benefits (Coovadia *et al.*, 2009). Fragmented, racially segregated, and increasingly privatised health care services were the essential characteristics of the apartheid regime (Chetty, 2007). Nowadays, South Africa, as a multiracial democracy, is home to nearly 57.7 million people, inclusive of 80.9% Black Africans as majority along with minority groups of Colored (8.8%), White (7.8%), and Indian/Asian (2.5%), while 62.9% of the reported population is urban (Coovadia *et al.*, 2009; Statistics South Africa, 2018a; The World Bank, Statistics SA, 2018).

Regarding economic growth, South Africa has experienced an average of 2.82% Gross Domestic Product (GDP) Growth Rate from 1993 to 2018, reaching the highest of 7.60% in 1994 and lowest of -6.10% in 2009 (SARB, 2018). In 2017, South Africa's Gross Domestic Product (GDP) Per Capita in PPP¹ (purchasing power parity) terms was estimated US\$ 13,498 (The World Bank, 2018), while

¹ Gross Domestic product (GDP) Per Capita in PPP is gross domestic product converted to international dollars applying the purchasing power parity rates. GDP at purchaser prices is defined as the sum of gross value added by all resident producers in the economy added to any product taxes and minus any subsidies which is not combined with the value of the goods (World Bank, 2018).

the country has obtained a Global Competitive Index (GCI)¹ score of 4.32 putting it in the 61st position of 137 countries and has remained as one of the superior competitive countries in Sub-Saharan Africa (Schwab, 2017). Notwithstanding positive economic growth, South Africa's Human Development Index (HDI)² value for 2015 set the country in the medium human development rank, ranked at 119th of 188 different countries and territories (UNDP, 2016b). Recent evaluations have revealed that 27.7% of the South African workforce is unemployed, which has an adverse effect on poverty and equality. This high level of unemployment is connected with various factors such as gradual job creation due to slow economic growth; racial and gender discrimination in the labour market as a lasting legacy of apartheid; unskilled workforce and spatial or geographical factors which impact on labour market outcomes. Moreover, according to the World Bank statistics, approximately half of South Africans are poor based on the national upper-bound poverty line of ZAR 992 per person per month in 2015 prices. Over the past two decades, South Africa has made strides in poverty reduction; however, high inequality is a hindrance in this regard, and high level of poverty (for an upper middle-income country) persists as a critical challenge for the country (The World Bank, Statistics SA, 2018).

Regarding gender-based discrimination, South Africa had a Gender Inequality Index (GII)³ value of 0.394, placing it in the 90th position of 159 countries in the 2015 index (UNDP, 2016a). This indicator reveals the fact that despite all the national commitment and improvement since democratisation, there is still a considerable gender gap in the country.

Since the birth of South African democracy in 1994, decreasing inequality and poverty has been the primary concern of the country's development programmes and policies: from the Reconstruction and Development Programme (RDP) in 1994 to the latest National Development Plan: Vision 2030 (NDP). As a redistributive technique, the government has used the 'social wage'

¹ Global Competitive Index (GCI) expresses the level of benefits that can be obtained by an economy through measuring the elements and institutions by both empirical as well as theoretical studies which determine improvements in productivity and economic growth, in the long term (Schwab, 2017).

² Human Development Index (HDI) is a summary measure which appraises the progress in three primary dimensions of human development: access to education, life expectancy, and standard of living (UNDP, 2016b).

³ Gender Inequality Index indicates gender-related inequalities in three scopes inclusive of economic activity, reproductive health, and empowerment. It also might be elucidated as the loss in human development as the result of disparities among male and female achievements in those three mentioned scopes. The value of GII varies in the range from 0 to 1, with 0 being 100% equality, and 1 being 100% inequality, meaning that women fare poorly compared to men. (UNDP, 2016a).

to enhance the security of the lives of the poor as well as improving their cost of living through providing free primary health care services; child support and old age grants; no-fee paying schools; and free essential services including sanitation, electricity, and water to impoverished households (The World Bank, Statistics SA, 2018). Despite the fact that these policies and agendas have provided some relief from the effects of unemployment and poverty since 1994, the country continues to face the challenge of high poverty, high unemployment, and high inequality. The Gini coefficient¹, as the measure of inequality, increased from 0.56 in 1995 to 0.63 in 2015, which is the maximum in the world. By different measures, South Africa has been reported as the most unequal country in the world: not only consumption expenditure inequality is high, but also inequality of opportunity is among the highest in the world (The World Bank, Statistics SA, 2018). Horizontal inequalities² between racial groups are also apparent in the distribution of resources, especially with regards to lower economic classes who, in the vast majority, are black, poor and with limited access to resources and opportunities (Meiring *et al.*, 2018).

South Africa – Health Status Indicators

In defiance of its economic position as an upper-middle income country along with significant social progress such as transforming the public health system to a comprehensive national service, the wellbeing and health of the majority of South Africans are still afflicted with the persistent burden of illness. This situation roots in weak management and major flaws in leadership and stewardship which have failed in the implementation of so-called good policies (Coovadia *et al.*, 2009; Mayosi *et al.*, 2014). In addition to the poverty-related diseases inclusive of maternal death, malnutrition, and infectious diseases which continue to be a widespread problem, the burden of non-communicable diseases is increasing as well (Coovadia *et al.*, 2009). In 2016, HIV/AIDS, lower respiratory tract infections, and road injuries were reported as top three causes of disability-adjusted life years (DALYs)³ among South Africans (Hay *et al.*, 2017).

¹ Gini coefficient is the most frequently used assessment of inequality varying from 0 to 1, by attributing 0 to total equality (Coovadia *et al.*, 2009).

² Horizontal inequality refers to the political and economic inequalities between “culturally”-delineated groups (Stewart, 2002).

³ Disability-adjusted life years (DALYs) for a disease or health condition is a measure of the sum of years of potential life lost due to premature mortality and the years of productive life lost because of disability (WHO, 2018).

According to South African health indicators, regardless of reported progress and improvements, not all the health-related MDGs were achieved (Statistics South Africa, 2015). Life expectancy in 2017 for South African females was 66.7 years and 61.2 years for males (Statistics South Africa, 2017a), having decreased from 1990 when it was 72.3 years for females and 67.1 years for males (Institute for Health Metrics and Evaluation, 2018). According to Statistics South Africa, the number of registered deaths has increased from 317 872 in 1997 to 456 612 in 2016, with an observed peak of 606 239 deaths in 2007 (Statistics South Africa, 2018b). The gendered statistics show a decrease in the percentage of male deaths from 55.9% in 1996 to 52.7% in 2016 while the percentage of female deaths has increased from 44.1% in 1997 to 47.3% in 2016 (Statistics South Africa, 2018b). The reported Infant Mortality Rate (IMR) and the Under-five Mortality Rate (U5MR) for 2016 were 34/1000 live births and 43/1000 live births, respectively, which has decreased compare to reported rates of 45/1000 live births for IMR and 57/1000 live birth for U5MR in 1990. These statistics indicate that the country failed to achieve the Millennium Development target 4 of reducing the under-five mortality rate by two-thirds from 1990 to 2015 (Statistics South Africa, 2015; UN IGME, 2017).

The high burden of communicable disease, particularly HIV/AIDS and TB, is one of the greatest challenges of the South African health system (SANAC, 2017). Based on 2018 mid-year reports, approximately 13.1% of the total population is HIV-positive and the prevalence of HIV/AIDS among adults (aged 15 to 49 years) is reported as 19.0% (Statistics South Africa, 2018a). Indeed, nearly one in five people living with HIV globally are in South Africa, although the rate at which South Africans are being infected is estimated to be decreasing from 1.9% in 2002 to 0.9% per annum in 2017 (SANAC, 2017; Statistics South Africa, 2017a). Moreover, South Africa has the sixth highest TB incidence globally (SANAC, 2017). In 2015, at an incidence of 834 per 100 000 people and an estimated 454 000 new diagnoses (63% in people living with HIV), TB was the major natural cause of mortality in the country (Statistics South Africa, 2016; Smith *et al.*, 2018). There has been only a modest decline in new cases since 2012, while MDR-TB is an expanding problem; with the number of MDR-TB cases doubling during 2007-2012. The majority (about 57%) of TB cases and TB-related deaths in South Africa occur in those infected with HIV (WHO, 2016b). Since 2012, South Africa has advanced towards controlling the epidemics of HIV and TB,

such that new HIV infections dropped from 360 000 in 2012 to 270 000 in 2016, with a remarkable advance in preventing mother-to-child HIV transmission. The South African health system has supported the most prominent antiretroviral therapy (ART) programme in the world, as approximately 3.7 million people initiated on ART before December 2016, leading to a considerable rise in national life expectancy from 58.3 years in 2011 to 62.4 years in 2015 (SANAC, 2017; Shearer *et al.*, 2017). In order to achieve the global targets as well as the national targets, South Africa has set the National Strategic Plan (NSP) for HIV, TB and STIs¹ 2017-2022, as its fourth plan (SANAC, 2017).

Non-communicable diseases (NCDs) including cardiovascular diseases (CVDs), diabetes, chronic respiratory disease and cancers are also dominant factors in the high burden of disease and premature mortality in South Africa, where the probability of death due to NCDs between ages 30 and 70 years is 27% (Gray and Vawda, 2017). The risk factors for NCDs are preventable and mainly include tobacco use, high consumption of alcohol, obesity, unhealthy diet, and physical inactivity (Caleyachetty *et al.*, 2015; Libman *et al.*, 2015; WHO, 2017a). In South Africa, unhealthy dietary factors and physical inactivity are two of the most critical risk factors for NCDs (Gray and Vawda, 2017). South Africa has experienced an epidemiological change with deaths arising mainly from non-communicable diseases. During 2011–2016, there had been a remarkable change in the leading causes of death away from infectious diseases towards non-communicable diseases; in 2016, nearly 57% of total reported deaths were caused by NCDs (Statistics South Africa, 2018b). In 2016, of the natural leading causes of mortality in South Africa, approximately 60% of diseases belong to the NCD category, resulting in nearly 117 400 deaths through: (1) diabetes mellitus (5.5% of total deaths); (2) other forms of heart disease (5.1% of total deaths); (3) cerebrovascular diseases (5.1% of total deaths); (4) hypertensive diseases (4.4% of total deaths); (5) ischaemic heart diseases (2.8% of total deaths); and (6) chronic lower respiratory diseases (2.8% of total deaths) (Statistics South Africa, 2018b).

The effect of chronic non-communicable disease expands not only to the individuals as patients but also to their households and the health system. These groups of diseases are likely to affect

¹ Sexually transmitted infections

individuals in their most economically productive years, causing a reduction in their household earning capacity due to a deducted ability to undertake productive labour (Puoanei *et al.*, 2008). Moreover, the treatment of chronic diseases puts a heavy burden on the already afflicted health system primarily as a result of the durability of treatment as well as the related financial expenditures (Puoanei *et al.*, 2008). In more recent years, the South African government has made some progress in the control of NCDs through launching new guidelines as well as disease prevention and health promotion policies to assist health care workers and facilities who are active in NCD care. Nonetheless, community-level management and prevention need to be enhanced to reach the SDGs of diminishing premature NCD mortality by one-third by 2030 globally (Gray and Vawda, 2017).

South Africa, within the context of a country in the thick of change, is experiencing one of the highest burdens of violence worldwide (Bola *et al.*, 2016). The victims of interpersonal violence are often acutely injured and require a high level of specialist investigation as well as surgical care, hence the physical and psychological injuries as the consequence of the violent crime place substantial financial burden on the South African health system and are the fourth growing public health crisis after HIV, TB, and maternal health care (Bola *et al.*, 2016; Wyatt *et al.*, 2017). In the past seven years, the proportion of mortality as a result of external causes of death has increased. In 2016, according to Global Burden of Disease (GBD) statistics, road injury and violence were respectively described as the third and fourth causes of disability-adjusted life years (DALYs) among the South Africans (Hay *et al.*, 2017; Statistics South Africa, 2018b). Furthermore, assault with 1.7% and transport accidents with 1.4% of all causes of death are among the top five external causes of deaths in the country (Statistics South Africa, 2018b).

Despite the fact that the South African constitution guarantees the right to health, more than two decades after democracy, immense health inequities persist in the country (Coovadia *et al.*, 2009). There is considerable variation in South African health status based on race, level of education, gender, income, geographical and even residential location (Obuaku-Igwe, 2015). By way of illustration, national prevalence estimates for HIV indicate that Whites and Indian/Asian population have the lowest prevalence of the disease (with 1.1% and 0.8%, respectively), while

the highest prevalence is reported among Black Africans (16.6%) (Human Sciences Research Council, 2018). In the case of the TB loss to follow-up rate by province, only KwaZulu-Natal achieved the national target of 5.4% in 2015, while the Western Cape had three districts with the loss to follow-up rates higher than 12.5%, which was far beyond the set target (Health Systems Trust, 2017). Moreover, large gender differentials in health between men and women continue, such that the reported mortality is approximately 1.12 times higher in men than in women, although the HIV infection rate is higher for women compared to men. Moreover, according to the WHO Global TB Report, the incidence of TB was higher among male patients than among females, as approximately 187 000 men and 135 000 women fell ill with TB in South Africa in 2017 (Human Sciences Research Council, 2018; Statistics South Africa, 2018b).

The noticeable disparities in the rates of mortality and diseases in the country reveal inequality in access to essential living circumstances as well as other social determinants of health including sanitation for the impoverished and the inequity between genders (Coovadia *et al.*, 2009; Mayosi *et al.*, 2012). Even though progress has been made in access to basic education, piped water, electricity, and social protection, persistence of inadequate economic growth, free-market policies, corruption, swift urbanization, migration, and mismanagement of public services by the post-apartheid government have widened the disparities; hence most South Africans remain harshly disadvantaged with deficient access to health services (Mayosi *et al.*, 2012; Benatar, 2013).

Tuberculosis in South Africa

South Africa, where there is a high prevalence of HIV, has the sixth highest TB incidence globally (SANAC, 2017). Currently, TB is the leading cause of mortality in the country. Around 438 000 South Africans acquired TB in 2016 of whom 182 000 were women, and 256 000 were men. (Statistics South Africa, 2016; Smith *et al.*, 2018). In contrast to the global picture, the majority (about 57%) of new TB cases and TB-related deaths in South Africa occur in those infected with HIV (WHO, 2016b). Besides, approximately 42% of reported new TB cases are estimated to be in women (WHO, 2017b). In recent years, the rate of successful treatment among new smear-

positive and smear-negative¹/extra-pulmonary² TB patients has improved while among retreatment cases, outcomes remain poor. Furthermore, approximately 25% of smear-positive TB cases experience initial loss to follow-up, which leads to continuing transmission and a higher risk of death (Churchyard et al., 2014).

The emergence of DR-TB has been a significant contributor to the high burden of TB in South Africa (Gray and Vawda, 2017). In order to address this epidemic, access to drug-sensitivity testing for all TB patients as well as effective second-line anti-tuberculosis treatment for all diagnosed drug-resistant TB patients is required (Gray and Vawda, 2017). Moreover, South Africa deals with the third highest number of DR-TB patients worldwide, after India and Russia. In 2015, 12 527 cases were reported to be enrolled on treatment, which was fourfold the figure reported for 2007. The DR-TB therapy results are unsatisfactory, with a success rate of about 50% (Gray and Vawda, 2017). More precisely, from the RR-TB cases reported to have begun second-line treatment in South Africa, only 48% of MDR-TB cases and 24% of XDR-TB cases who started treatment in 2013 were recorded as successfully treated (Gray and Vawda, 2017). Worldwide, the majority of reported cases of XDR-TB, as the most resistant form of TB which is hard to treat and affiliated with high mortality rates and failure of therapy, are from South Africa (O'Donnell *et al.*, 2014). XDR-TB in South Africa is attributed to a high percentage of HIV co-infection, early mortality, and inferior treatment outcomes (O'Donnell *et al.*, 2014). Moreover, since HIV-infected patients are at an elevated risk of acquiring TB infection, the intersection of the human immunodeficiency virus-1 (HIV-1) and TB has caused an exceptional double burden of disease in the country (Akolo *et al.*, 2010; Meintjes, 2014). Although South Africa encompasses 0.75% of the total world population, it is approximated that of all cases of HIV-associated TB that occur each year globally, 30% are in South Africa (Meintjes, 2014).

¹ A sputum smear is a laboratory test that looks for *Mycobacterium tuberculosis* in a sputum sample. Sputum is the material that comes up from air passages when patients cough deeply (UNDP, 2015). Generally, smear-positive patients with TB are judged to be more infectious than smear-negative patients (Hernández-Garduño *et al.*, 2004).

² Pulmonary tuberculosis is TB that affects the lungs while the extra-pulmonary is the progression of TB disease which spreads from the lungs to locations outside the lungs such as bones, kidneys, etc. (Sreeramareddy *et al.*, 2008).

South Africa's National Response to Tuberculosis

In South Africa, the National Tuberculosis Control Programme (NTCP) was developed in 1995 based on the WHO's DOTS strategy (South African National Department of Health, 2008). In the South African public health system, TB services, as well as other services, are provided through a decentralised model. Based on this model, the National Department of Health regulates overall health policy direction while provincial and city departments of health are in charge of service delivery through the district health system (Birch *et al.*, 2016).

In the year 2006, concerning the increasing burden of MDR-TB along with the appearance of XDR-TB which added further strain to an already overburdened health sector, and with regards to address the twofold epidemic of TB and HIV, South Africa established a structured National Strategic Plan (NSP) for HIV, TB and STIs (2012-2016). “The targets set in the NSP for TB were to halve TB incidence and mortality by 2016 and to have no new TB infections, deaths or stigma by 2032” (Churchyard *et al.*, 2014, p.244). During 2012-2016 South Africa made remarkable progress in enhancing TB control. As an example, there had been a 21% decrease in TB-related mortality, from 41 904 deaths in 2013 to 33 063 in 2015, yet the burden of TB remained immense (SANAC, 2017). Based on mathematical modelling suggestions, besides doing the basics better, scaling up ART as well as earlier ART initiation, scaling up use of Xpert MTB/RIF as a substitution for sputum smear microscopy, and enhancement of targeted case detection in health care facilities would have a considerable impact on TB control (Churchyard *et al.*, 2014; SANAC, 2017).

The NSP for HIV, TB and STIs (2017-2022) is South Africa's fourth plan. The plan includes eight goals, all aligned with a number of objectives as well as sub-objectives (SANAC, 2017). The goals set for TB are as follow:

- 1: Speeding up the preventive services to cut new TB cases
 - Objective: Decreasing the incidence of TB by at a minimum of 30%, from 834 cases per 100 000 people (2015) to fewer than 584 cases per 100 000 people by the year 2022.

- 2: Diminishing morbidity as well as mortality of TB through supplying TB treatment as well as adherence support for all
 - Objective: Applying the 90-90-90 strategy for TB: detect 90% of all TB cases and provide them appropriate therapy; detect at least 90% of the TB cases in key populations and put them on appropriate therapy and; successfully cure 90% of those diagnosed with DS-TB.
- 3: Covering all key as well as vulnerable populations through tailored and aimed interventions
- 4: Addressing the social and structural causes of TB
- 5: Basing the response to TB on the fundamental human rights
 - Objectives: Promoting access to justice for TB-infected patients and other individuals who are vulnerable to TB; assisting an environment that preserve human rights and hinders stigma as well as discriminations.
- 6: Enhancing both leadership and shared accountability for an endurable response to TB
- 7: Mobilizing resources to assist the achievement of the NSP goals
- 8: Improving strategic information to make progress in achievement of the NSP goals
 - Objectives: Upgrading health information for data utilisation, monitoring and evaluating the implementation and outcomes of the NSP; expanding the national surveillance system to generate periodic TB measures in the general population as well as vulnerable populations; developing strategic researches in order to gain approved evidence for innovation and; advancing the efficiency and enhanced impact (SANAC, 2017).

Literature Review

Introduction

TB stands as a major public health challenge in numerous low- and middle-income countries (LMICs), inclusive of South Africa. Despite the availability of effective TB treatment and therapeutic regimens recommended by WHO (DOTS), treatment success depends on adherence to the treatment regimen of daily drugs (Sabaté *et al.*, 2003; Birch *et al.*, 2016). Considering the infectious nature of TB as a communicable disease, high level of adherence is necessary to decrease the risks of morbidity, mortality along with drug resistance at the individual as well as community levels (Sabaté *et al.*, 2003; Birch *et al.*, 2016). The following literature review aims to summarise studies from South Africa and similar settings that have analysed adherence to TB treatment through a gender lens.

The Concept of Adherence

Even though the term adherence has been understood mostly as “medication adherence”, the conclusion of the WHO Adherence meeting in 2001 revealed the need for a broader description of adherence (Sabaté *et al.*, 2003). Over the past few years, concurrent with a paradigm change in patient-provider interaction which is characterized by patient empowerment and autonomy, the perception of patient's role has shifted from a “passive, acquiescent recipient of expert advice” to “an active collaborator in the treatment process” (Sabaté *et al.*, 2003, p.3; Pulvirenti *et al.*, 2014). Consequently, adherence is not only concerned with taking prescribed pharmaceuticals but also includes a wide range of health-related behaviours which can potentially enhance the patients' health outcomes encompassed with the health care providers' recommendations (Sabaté *et al.*, 2003). According to several studies, patient-related factors have been frequently cited as the reasons for issues with adherence, while the role of provider and health system-related determinants have been broadly neglected. However, Sabaté *et al.* (2003) argues that the patient-provider partnership is a crucial factor in adherence (Sabaté *et al.*, 2003). The WHO suggested definition of adherence, “the extent to which a person's behaviour taking medication, following a diet, and/or executing lifestyle changes, corresponds with agreed recommendations from a health care provider”, gives a high weight on patient's agreement to

the recommendations, as active partners with health providers in their health care (Sabaté *et al.*, 2003, p.3).

Adherence to Tuberculosis Treatment

Regarding TB control, adherence can be defined as the extent to which the patient's history of remedial drug-taking concurs with the prescribed treatment regimen (Van den Boogaard *et al.*, 2011). Measurement of adherence to treatment may be either outcome-oriented or process-oriented. Outcome-oriented approaches use the final results of treatment as an index to measure success such as cure rate, while process-oriented indicators use the intermediate variables to measure adherence, for example, pill counts. The extent that these intermediate outcomes correspond to the actual quantities of prescribed drugs taken is unknown (Sabaté *et al.*, 2003). On the other hand, non-adherence may be (1) failure to take any medication; (2) early suspension of treatment or (3) aberration from the prescribed treatment in other ways, inclusive of brief treatment interruptions as well as miss-dosing (Van den Boogaard *et al.*, 2011). At this point, however, there is no empirical definition of non-adherence in TB management and a few approaches that have intended to do this have been entangled. To be more accurate, DOTS as the standard TB treatment guideline, allows a specific level of flexibility respecting an intermittent medication regimen. For instance, treatment can be directly observed by the provider either daily or weekly (Sabaté *et al.*, 2003; Munro *et al.*, 2007). Thus, the definition of adherence to TB treatment needs to be translated into an empirical method of monitoring both the dosage and timing of the medication taken by TB-infected patients. Therefore, the success of treatment, here considered as the total number of the individuals who are cured and those who have completed therapy under DOTS strategy, can be reasonable, yet a proxy, indicator of treatment adherence (Sabaté *et al.*, 2003).

Factors Affecting Adherence to Tuberculosis Treatment

Consistent with the view of a majority of studies that inspected adherence to treatment for TB, is the point that adherence cannot be defined, controlled, or predicted with a single factor. Additionally, according to Hugtenburg *et al.* (2013), non-adherence with medication is a “complex and multidimensional health care problem”, and “the causes of non-adherence may be related to the patient, treatment, and/or health care provider” (Hugtenburg *et al.*, 2013, p.675).

For each patient, adherence barriers go counter to a number of encouraging factors, and the ultimate estimate of patients' adherence relies on which factors prevail. As a result, efforts that attempt to boost adherence, treatment results and eventually, to hinder the worldwide epidemic of TB, demand a clear insight into barriers as well as facilitators in the context of adherence to TB treatment, with specific focus on patient experiences of taking medication (Munro *et al.*, 2007; Gebremariam *et al.*, 2010). In terms of TB infection, patients' adherence and the outcomes of treatment are tied to regular access to TB services during the treatment course. For the purpose of current study, the particular facilitating factors and barriers to the access and adherence to treatment for different genders have been classified concerning the three dimensions of access: availability, acceptability and affordability (Thiede *et al.*, 2007; McIntyre *et al.*, 2009).

Acceptability

Acceptability of TB treatment influences patient adherence in different ways, such as the nature of the relationship between patients and health providers, their information on TB and assurance of appropriateness of the treatment, social networks, complexity of the regimen and cultural belief systems (Sabaté *et al.*, 2003).

Munro *et al.* (2007) carried a systematic review to find the critical factors affecting adherence to TB treatment through investigating several qualitative researches. Their findings suggested that the interaction between patients and providers had a significant influence on the treatment adherence of TB patients. Mistreatment and poor follow-up led to non-adherence, notably when patients were blamed for the missed visits (Munro *et al.*, 2007). Furthermore, some studies reveal that stigma related to TB infection occurs in many health facilities and intensifies problems of adherence. In the case of insufficient privacy between caregivers and patients, they refrain from collecting medicines as a result of health workers' discriminatory behaviour towards patients (Kaona *et al.*, 2004). Therefore, patients were more adherent to treatment when there was positive interaction between patients and health care providers (Munro *et al.*, 2007).

The essence of directly observed therapy is also discussed by Munro *et al.* (2007), concerning the acceptability of treatment. Several researches which were reviewed by the authors revealed the patient's negative opinion about direct-observation as well as their distrust of the health care

providers (Munro *et al.*, 2007). These are the same findings as those from a South African trial which made a comparison between self-supervised TB treatment and DOTS by which the latter was seen to have a disheartening effect on TB patients and consequently, adverse consequences for adherence, particularly for retreatment patients (Volmink and Garner, 2007). In a similar vein, Birch *et al.* (2016) using a mixed method study, investigated the association between daily treatment collection and adherence to TB treatment among South Africans patients. Their findings indicated that adherence did not appear to suffer in patients who were not necessitated to make daily clinic visits. Moreover, daily clinic visits impose substantial treatment burdens on the patients, their families, and on the health care system regarding the human resource requirements (Birch *et al.*, 2016).

In a number of studies, the role of knowledge and beliefs on treatment methods as well as the effectiveness of these practices in the health seeking behaviour of TB patients, are taken into account. As reported by Munro *et al.* (2007), some patients will quit treatment as soon as they feel better or their signs and symptoms of TB Disease have been relieved or discontinue therapy if they see no bettering in their health condition. Based on reviewed studies a probable justification for this issue is that patients are not appropriately told about the infectious nature of TB, the course of therapy as well as the non-adherence consequences. Moreover, low levels of trust in public health services and being in fear of the TB diagnosis may have contributed towards patient's uncertainty of the efficacy of the therapy and the validity of the diagnostic tools (Munro *et al.*, 2007).

One of the noticeable acceptability-related hindrance to adherence to TB therapy is the TB-related stigma (Udwadia and Pinto, 2007). According to a research on adherence to TB treatment in a South African community, more than 90% of participants blamed the irresponsible patients for spreading the infection, and three-quarters of respondents thought that those who forget to take their treatment because they drink and smoke deserve to suffer from the disease (Cramm *et al.*, 2010). Furthermore, a number of studies have shown that gender-specific stigma in case of TB is an obstacle to women accessing TB care (Onifade *et al.*, 2010). The burden of TB stigma falls more on women rather than men. In some communities, a woman who is infected by TB

may be divorced or, if she is unmarried, being infected would lead to lower chance of finding a husband (Waisbord, 2004; Sen *et al.*, 2007). A study in Vietnam similarly found that isolation, ostracism and rejection were results of TB diagnosis for some women who experienced remoteness from both family and community (Long *et al.*, 2001).

Availability

The availability of TB diagnostic as well as treatment services can influence adherence in various ways. A cohort study conducted by Shargie and Lindtjorn (2007) in southern Ethiopia, determined the factors that increase the TB treatment non-adherence (Shargie and Lindtjorn, 2007). The findings reveal that availability-related barriers that limit physical access to TB facilities, especially in rural settings, are among the determinant factors of treatment failure (Shargie and Lindtjorn, 2007). Based on these findings the distance between the patient's home and health facilities is highly associated with adherence to daily-DOTS treatment; about half of the participants who failed to complete their TB treatment were living at areas not within reach of a TB facility in less than two hours' walk. Moreover, the patient's reliance on public transport diminished their chance of completing the treatment (Shargie and Lindtjorn, 2007). Munro *et al.* (2007) in a systematic review about factors related to treatment adherence, also represent same results through which absence of available transport and long distances were reported as the primary reasons for non-adherence (Munro *et al.*, 2007).

Regarding TB, the signs and symptoms of the infection are generally severe and exhausting that makes it difficult to travel alone. Hence the considerable distances to treatment facilities, as an availability barrier, is aggravated by TB symptoms. In a study conducted by Gebremariam *et al.* (2010), majority of patients convey that the burden of travelling long distance in order to get to the health facilities extends beyond themselves, since they are in need of their family members' accompaniment to get to the facilities which increases the probability of skipping the visit (Gebremariam *et al.*, 2010). These results are consistent with the findings of a study conducted by Sagbakken *et al.* (2008) where they observed that health seekers who travelled on their feet for about two hours to show up at the TB clinic described the journey as intensely difficult, and they experienced frequent fainting and vomiting during travelling. Moreover, these patients also reported that as a result of weak management they had to wait for a couple of hours before

being visited by a health professional (Sagbakken *et al.*, 2008). Furthermore, long waiting times in queues, inconvenient appointment times, and lack of flexibility in operation hours may cause high levels of non-adherence to TB treatment as well as loss to follow up (Sabaté *et al.*, 2003; Munro *et al.*, 2007).

Concerning gender-specific availability barriers, some studies have found lack of attention from health care providers to women patients who access TB services, which means women must wait longer than men to receive the diagnosis as well as treatment (UNDP, 2015). For example, Long *et al.* (1999) in a study conducted in Vietnam, found that as a result of delays caused by health care providers, women infected by pulmonary TB were diagnosed approximately two weeks later than men (Long *et al.*, 1999). Likewise, a study from Bangladesh revealed that women with TB experienced inevitably longer delays to be diagnosed than men (Begum *et al.*, 2001).

In efforts to enhance the availability of TB treatment through decentralisation and tackling the physical barriers to treatment adherence, different systems are provided to assist the delivery of pre-packaged doses to the TB patients' home (Macq *et al.*, 2003). Practically, these systems have presented their specific barriers. In the case of Pakistan, some assigned community health workers (CHW) asked patients to travel to their private residences instead of delivering medications to the patient's homes. On the other hand, patients declared that they would prefer to conceal their disease due to the fear of stigmatising attitudes within their community against TB patients (Khan *et al.*, 2005). Based on a mixed-method analysis conducted by Birch *et al.* (2016), several patients who attended clinics on a daily basis admitted that DOTS with daily supervision had imposed a high transportation cost burden on them while most of them were already dependent on their relatives or friends to provide them with money to pay for their treatment (Birch *et al.*, 2016).

Affordability

Even though TB diagnosis and care in South Africa is free at the first point of service, patients have to pay considerable costs (direct and indirect) related to TB infection and treatment (Foster *et al.*, 2015). So, the affordability-related determinants of access impose an undeniable strain on adherence. TB treatment needs frequent service use which generally takes between six and nine

months. In the case of any drug resistance or recovery, it might even require more extended service use (Cleary *et al.*, 2013).

In 2008, a qualitative study conducted in Ethiopia analysed the obstacles and facilitating factors to TB treatment. This study inferred that the management of TB therapy is the result of a dynamic process including the interaction of patients with their community. In such a process, different social as well as economic costs interact or change through the years (Sagbakken *et al.*, 2008). Moreover, based on their findings loss of employment caused a series of interconnected barriers for most of the participants, as those who had insufficient financial resources or lack of support from their social networks might find their available resources inadequate to incur total costs of attending treatment, which is a barrier to adherence of TB patients (Sagbakken *et al.*, 2008).

A similar result was found by Gebremariam *et al.* (2010), where the authors concluded that DOTS was challenging for patients with irregular jobs (Gebremariam, *et al.*, 2010). The time-consuming nature of DOTS, as well as severe symptoms of the disease, led a large number of individuals to quit their jobs (Sagbakken *et al.*, 2008). By taking Khan *et al.* (2005) study into account, it is concluded that different genders are unequally burdened by time costs whereby work-related time costs and family-related time costs impose a higher barrier to men and women, respectively (Khan *et al.*, 2005).

Transportation costs are also a serious barrier to access especially for the patients with financial difficulty who need to sell off their belongings to afford transportation costs to TB treatment facilities (Gebremariam *et al.*, 2010). Furthermore, based on the findings of a study in rural South Africa, transport costs amount to 42% of direct costs for all patients and 51% of direct costs in the case of the most deprived quintile. This high direct cost is a barrier for sick and old people who are not able to walk several kilometres to get to health facilities (Goudge, Gilson, Steven Russell, *et al.*, 2009).

It is estimated that TB infection causes the adult patients to lose nearly three to four months of productivity which leads to a reduction of approximately 30-40% in household income (Udwadia and Pinto, 2007). According to the findings of Sagbakken *et al.* (2008), the majority of respondents ranked their employment and income higher than treatment adherence in order of

importance (Sagbakken *et al.*, 2008). Other patients who adhered to their treatment through visiting the health facilities, because of the loss of revenue, became impoverished and unable to afford basic foods and hunger decreased their motivation to continue the treatment (Sagbakken *et al.*, 2008). Lack of food was also mentioned as one of the main reasons of interruption of TB drug taking in a cross-sectional study in Zambia, where 11.4% of non-compliant patients mentioned lack of food at home as the main reason for stoppage of treatment (Kaona *et al.*, 2004).

Based on a number of studies, women's lack of financial independence, as well as the low prioritisation of women's health by family members, are some common barriers to women accessing TB care in various settings. For instance, Onifade *et al.* (2010) showed that TB care for women was of inferior importance to that of men amongst TB control stakeholders (Onifade *et al.*, 2010). Moreover, concerning economic inequalities among households, there can be significant differences in health gradients between genders so that medical poverty trap may impact men and women in different ways and to different extents (Sen *et al.*, 2007).

As it is discussed, direct and indirect costs are dependent on other dimensions of access: availability and acceptability. The social networks have a critical role in a patient's ability to cope with the therapy expenses. Despite the high degree of stigma associated with TB infection, Sagbakken *et al.* (2005) noted that during critical situations, many individuals use the shared resources from their households or friends to overcome the barrier to access and start or continue the treatment. Social support has also been shown to encourage adherence (Sagbakken *et al.*, 2008; Gebremariam *et al.*, 2010). Nevertheless, it should be considered that reliance on the social networks to cover the expenses of treatment is conditional upon the availability of such networks. In the case that social support does not exist, and patients face access barriers, untreated infection and premature death will increase.

Problem Statement

Tuberculosis is one of the significant public health challenges in South Africa, where TB incidence is among the highest in the world. Despite the fact that South Africa made great efforts to address the needs of exposed populations, the pace of impacting on the epidemic should be accelerated

in order to reach the national and international targets to end the TB pandemic; however, the South African health system is dealing with several challenges in this regard (SANAC, 2017). On the one hand, the DR-TB is a significant problem to end TB in South Africa given that the number of DR-TB cases doubled between 2007 and 2012. Treatment results are unsatisfactory, and success rate of treatment is roughly 50% of national and global targets (Cox *et al.*, 2017; SANAC, 2017). Developing access to culture and drug susceptibility testing (DST) for TB diagnosis may help conquer this issue (Dowdy *et al.*, 2008). While most of the present first-line TB drugs were developed many years ago, they can have a significant treatment success rate if patients are adherent (Shin and Kwon, 2015). Hence, in the light of the infectious nature of TB, for the sake of controlling the level and spread of the disease as well as preventing drug resistance, adherence to treatment is crucial. Adherence, in turn, will be influenced by the accessibility of needed care. On the other hand, barriers and facilitating factors to access and adherence to TB treatment are affected by different social determinants of health, inclusive of gender.

A number of previous studies have attempted to explain how gender intersects with access barriers to TB treatment in various ways. In this regard, several countries reported gender as an essential factor in accessing TB services (Kilale *et al.*, 2008). However, findings are frequently conflicting in different settings. For instance, Begum *et al.* (2001) found that females with respiratory symptoms had less access to public out-patient clinics compared to males, and were less likely to go through sputum smear test in Bangladesh (Begum *et al.*, 2001). On the contrary, Iqbal *et al.* (2011) found that among suspected TB cases in Pakistan, females are two times more likely than males to undergo sputum smear test (Iqbal *et al.*, 2011). Based on some other studies, males with TB symptoms are more likely to delay seeking treatment for longer than females, and male TB patients tend to quit TB treatment as well as to be lost to follow-up, so they are more likely to die from TB (van den Hof *et al.*, 2010).

In South Africa, numerous studies have been done regarding TB infection in various domains. For example, Foster *et al.* (2015) explore the economic burden of TB diagnosis and treatment in South Africa. Birch *et al.* (2016) analysed the relationship between the type of DOTS strategy and adherence to TB medication. However, none of the previous studies investigated inequalities in

access to TB services by gender in South Africa. This study aims to fill this void through investigating gender inequality in access to TB services in South Africa.

Justification

TB remains one of the most crucial health challenges globally, causing preventable morbidity and mortality, and continues to be one of the serious health threats in South Africa (WHO, 2017b). The gender aspects of TB access have been an overlooked research area (Thorson *et al.*, 2007; UNDP, 2015). Gender-related access barriers to TB services can impact both men and women. Generally, men face a higher risk of developing TB and more TB deaths in comparison with women. They are also more vulnerable to TB because of gender-specific occupations (like mining or blasting), while women may have inferior access to TB treatment and prevention services than men who are more likely to go through sputum smear examinations (The Global Fund, 2017). There is a critical need to direct research towards understanding gender-specific barriers to access as well as adherence to TB treatment in order to efficiently enable women and men to access TB services (UNDP, 2015). Consequently, it follows that evidence-based analysis is crucial to quantitatively determine the characteristics of the interaction between gender, access and adherence to TB treatment in South Africa.

Research Question

The question that frames this study is:

Do men and women have equitable access to TB services in South Africa?

Objectives

This study attempts to address the ensuing objectives:

- 1) To describe levels of adherence to TB medication by sex, in South Africa.
- 2) To describe differences in access barriers by sex, in South Africa.
- 3) To describe the relationship between adherence and access by sex, in South Africa.

Conceptual Framework

Equity in health care is frequently defined with regard to access to health services. Access can be simply described as the opportunity to use health services while the core of access includes the

nature of the interaction between patients and the characteristics of the health system regarding delivery and financing. The precise meaning of access is generally unclear (Thiede *et al.*, 2007). The overall approach of this study is guided by a comprehensive conceptual framework by which access, as a multidimensional concept, is determined through the interaction between the health demands of the patients and the acceptability, availability and affordability of the health system responses (McIntyre *et al.*, 2009).

Methods and Analysis

This section presents a short description of the dataset with further explanation about analytical techniques that are used to fulfil the objectives of the study.

Data Source

The present study will be based on dataset derived from the Researching Equity in Access to Health Care (REACH) project. REACH was a five-year study of health care access in South Africa which was launched in 2007. In summary, REACH explores inequity in access to health care services across three health interventions (“tracers”): antiretroviral therapy (ART), maternal health services and TB treatment services across four health sub-districts in South Africa: Hlabisa (KwaZulu-Natal), Bushbuckridge (Mpumalanga), Soweto Region D of the City of Johannesburg (Gauteng), and Mitchell's Plain (Western Cape) (Schneider *et al.*, 2012). The REACH project sought for a multi-dimensional understanding of 'degree of fit' between health care service users and providers concerning availability, affordability and acceptability of health care services (Schneider *et al.*, 2012). The author of this protocol had no cooperation in the data collection of the REACH study.

Study Setting

Four study populations were selected as the sampling frame for this research in different provinces, as it is illustrated in Figure 1: two in urban areas (Mitchells Plain, Western Cape and Soweto Region D, Gauteng) and two in rural areas (Bushbuckridge, Mpumalanga and Hlabisa, KwaZulu-Natal). The logic of this selection was to consider different geographic sites as well as to allow for variations in governance context through studying different provinces with extensive decision-making autonomy (Schneider *et al.*, 2012). This sampling frame provides the

opportunity of comparing the rural-rural, urban-urban and urban-rural differences (Schneider *et al.*, 2012).

Sampling of TB Service Users and Health Facilities

Two-stage sampling was used in each of the four sub-districts. The first stage was recruiting a representative sample of primary health care facilities, then an adequate sample of users in each of these facilities. In most public health facilities in South Africa, TB services are provided. Using probability proportional to size (PPS) method, a minimum of five facilities were chosen in each sub-district. A random sample of TB patients, in every selected facility, was interviewed until the target facility sample size was obtained. The chi-squared 'goodness of fit' test was employed to calculate the sample size, comparing the socio-economic distribution of need with a hypothetical pattern of unequal use based on Bushbuckridge as the example. From this, the planned sample size was 1200 respondents, and a minimum of 300 TB patients were interviewed in each sub-district. Subjects were included if they were older than 18 years old and had been on TB treatment for a period of over two months (Schneider *et al.*, 2012).



Figure 1. Geographic location of REACH sites (Schneider *et al.*, 2012).

Data Collection

There are two major elements in REACH project field work; first is the interviewer-administered exit interview that collected socioeconomic and demographic data, patient's perspectives regarding the access-barriers to TB services, self-reported adherence to TB medication, and visits to health services or DOTS supporters for TB care; second is the review of patient records. The data gathering instruments which are used to collect required data are as follows: (a) exit interview questionnaire for TB users (Appendix A); (b) patients record review of TB services (Appendix B) (Schneider *et al.*, 2012).

The data collection process was directed by the previously discussed conceptual framework of access through which access is determined with respect to the degree of fit between the health demands of the individuals and the acceptability, availability and affordability of the health services, as shown in Figure 2 (McIntyre *et al.*, 2009). Based on this framework, the physical elements (availability), financial elements (affordability) and cultural elements (acceptability) can be probed to evaluate the health care access and the potential barriers of this access. Each of the mentioned access dimensions is presentable by a number of variables.

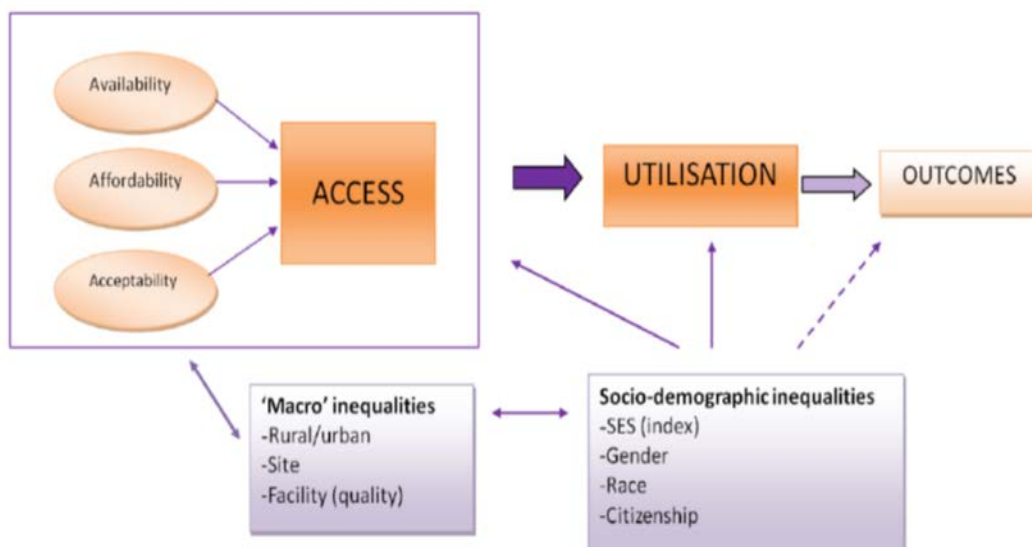


Figure 2. REACH Conceptual Framework (Schneider *et al.*, 2012).

Trained interviewers administered a structured exit interview questionnaire in the language of patients' preference. Subjects were questioned about the acceptability, availability and affordability of TB services through a set of questions that covered particular determinants underlying these dimensions (Schneider *et al.*, 2012). The availability is described by variables such as patient's travelling time to the facility, the waiting time at the facility for health professional visit, the time spent in the clinic to collect medication, the modes of transportation to the clinic, and how often they were supposed to fetch their TB drugs from the facility. Affordability variables involved coping strategies including whether the patients were forced to borrow money to cover the expenses of therapy, as well as information on health care expenditure in comparison to the patient's overall household expenditure. Regarding the acceptability element, patients were asked about their perceptions of health care providers' attitudes, facility cleanliness, waiting time in queues and the stigma of receiving as well as treating a TB diagnosis (Cleary *et al.*, 2012). Also with regards to the level of adherence, patients were asked about missed clinic visits and missed treatment doses (Birch *et al.*, 2016). Furthermore, patients' records were reviewed in order to obtain a more comprehensive understanding of the barriers in accessing TB treatment. Moreover, to compare services within the facilities with standard treatment guidelines, patient record reviews were undertaken (Schneider *et al.*, 2012).

All interviews were taken with the condition that patients were given the security to disclose information; in this regard, a private room at each facility was considered for all interviews, and only the interviewer and subject were in attendance. Interviews were conducted after the completion of care at that visit and field workers were not a member of staff at the facility. Data collection coordinators examined the accuracy of completed questionnaires within each site. After approval, responses were entered into a data entry platform which was built in EpiData software program (Schneider *et al.*, 2012).

Data Analysis

Data were analysed using Stata/IC 15.0. The asset index approach was used to estimate the Socioeconomic status (SES) of respondents. Although some argue that SES is best measured by household income, consumption or expenditure, these data are generally difficult to collect and

are seldom available in developing countries (Montgomery *et al.*, 2000). The asset index approach seeks to assign individuals to socioeconomic classes based on household characteristics (such as type of house, walls, toilet facility, roof, water supply, electricity for cooking, etc.) and assets (including fridge, stove, DVD player, television, cellphone, bicycle, etc.) (Booyesen *et al.*, 2008; Cleary *et al.*, 2012). The index will be constructed by performing a multiple correspondence analysis (MCA). While the construction of SES indices is regularly achieved using principal components analysis (PCA), this method is more appropriate for normally distributed data, as opposed to the predominantly categorical data often used in SES indices development. For these reasons, multiple correspondence analysis will be more appropriate (Booyesen *et al.*, 2008; Howe *et al.*, 2008; Birch *et al.*, 2016).

In this analysis, we will divide the exit interview template in three analytical scopes, i.e. acceptability, affordability as well as availability. The scope of availability will embrace physical access aspects inclusive of travelling time to the clinic, the waiting time to visit the health care professionals and the mode of travel. The acceptability domain will encompass cultural access aspects that involve variables related to structural elements such as facility sanitation, stigma and health care staffs' attitudes. The affordability domain will cover financial access aspects like if the patient is receiving disability grant or not, the total monthly expenditure on health care considering different types of providers, the health expenditure as a percentage of total household expenditure, and patient's coping strategy to deal with the costs of health care.

Adherence to therapy has been defined in various ways in different policy and research contexts (Sabaté *et al.*, 2003). For this study, the level of adherence will be measured through a process-oriented approach by which the intermediate variables of having ever missed a TB clinic visit or missed a dose of TB medication will be used as a proxy for non-adherence.

Summary statistics will be used to compute average scores for each access variable by gender¹, and multivariate logistic and linear regressions will be used to test for differences in access by gender as well as to explore the correlation between gender and patients' level of adherence,

¹ In REACH project “sex” is used as a proxy for “gender”.

after controlling for socioeconomic characteristics such as asset index, employment status, education, and duration on TB treatment. Doing so will allow us to focus expressly on the gender-level access barriers, after holding other variables constant.

Limitation of the Study

A major limitation of the current study is that we are exploring access barriers in a sample of patients who have gained entry to the primary health care facilities and are taking TB treatment, while impediments to access to TB health services might be different for those who have never gotten entry into the TB facilities or patients with severe as well as drug-resistant TB infection who need care at secondary care facilities. Furthermore, access barriers are likely to be context specific; hence, the findings from this study may not be generalizable to the rest of South Africa or other countries.

Research Ethics

The present study will be based on a secondary dataset which has already been coded and adjusted in order to discard confidential and sensitive information. Nonetheless, before the start of the current study, ethics approval has been acquired from the Faculty of Health Sciences' Human Research Ethics Committee of the University of Cape Town (Appendix C). Furthermore, approval for the REACH project, from which this study is a subset, was provided by Ethics committees at the Universities of Cape Town (Appendix D), KwaZulu-Natal and Witwatersrand.

Bibliography

- Akolo, C., Adetifa, I., Shepperd, S. and Volmink, J., 2010. Treatment of latent tuberculosis infection in HIV infected persons. *Cochrane database of systematic reviews*, (1).
- Ankrah, A. O., Glaudemans, A. W. J. M., Maes, A., Van de Wiele, C., Dierckx, R. A. J. O., Vorster, M., Sathekge, M. M., 2018. Tuberculosis. In: *Seminars in Nuclear Medicine*, 48(2), pp. 108-130.
- Begum, V., De Colombani, P., Das Gupta, S., Salim Md A, H., Hussain, H., Pietroni, M., Rahman, S., Pahan, D. and Borgdorff, M., 2001. Tuberculosis and patient gender in Bangladesh: sex differences in diagnosis and treatment outcome. *The International Journal of Tuberculosis and Lung Disease*, 5(7), pp.604-610.
- Benatar, S., 2013. The challenges of health disparities in South Africa. *SAMJ: South African Medical Journal*, 103(3), pp.154-155.
- Birch, S., Govender, V., Fried, J., Eyles, J., Daries, V., Moshabela, M. and Cleary, S., 2015. Does treatment collection and observation each day keep the patient away? An analysis of the determinants of adherence among patients with Tuberculosis in South Africa. *Health policy and planning*, 31(4), pp.454-461.
- Bola, S., Dash, I., Naidoo, M. and Aldous, C., 2016. Interpersonal violence: quantifying the burden of injury in a South African trauma centre. *Emerg Med J*, 33(3), pp.208-212.
- Booyesen, F., Van Der Berg, S., Burger, R., Von Maltitz, M. and Du Rand, G., 2008. Using an asset index to assess trends in poverty in seven Sub-Saharan African countries. *World Development*, 36(6), pp.1113-1130.
- Borrell, C., Palència, L., Muntaner, C., Urquía, M., Malmusi, D. and O'campo, P., 2013. Influence of macrosocial policies on women's health and gender inequalities in health. *Epidemiologic reviews*, 36(1), pp.31-48.
- Braveman, P. and Gruskin, S., 2003. Defining equity in health. *Journal of Epidemiology & Community Health*, 57(4), pp.254-258.
- Caleyachetty, R., Echouffo-Tcheugui, J.B., Tait, C.A., Schilsky, S., Forrester, T. and Kengne, A.P., 2015. Prevalence of behavioural risk factors for cardiovascular disease in adolescents in low-income and middle-income countries: an individual participant data meta-analysis. *The Lancet Diabetes & Endocrinology*, 3(7), pp.535-544.
- Chetty, K.S., 2007. Equity promoting health care policies in South Africa: a literature review commissioned by the Health Systems Knowledge Network.
- Churchyard, G.J., Mametja, L.D., Mvusi, L., Ndjek, N., Hesseling, A.C., Reid, A. and Babatunde, S., 2014. Tuberculosis control in South Africa: Successes, challenges and recommendations. *South African Medical Journal*, 104(3), pp.244-248.
- Cleary, S., Birch, S., Chimbindi, N., Silal, S. and McIntyre, D., 2013. Investigating the affordability of key health services in South Africa. *Social science & medicine*, 80, pp.37-46.

- Cleary, S.M., Birch, S., Moshabela, M. and Schneider, H., 2012. Unequal access to ART: exploratory results from rural and urban case studies of ART use. *Sex Transm Infect*, 88(2), pp.141-146.
- Coburn, D. and Coburn, E.S., 2007. Health and health inequalities in a neo-liberal global world. *The economics of health equity*, pp.13-35.
- Coovadia, H., Jewkes, R., Barron, P., Sanders, D. and McIntyre, D., 2009. The health and health system of South Africa: historical roots of current public health challenges. *The Lancet*, 374(9692), pp.817-834.
- Cox, H., Dickson-Hall, L., Jassat, W., Moshabela, M., Kielmann, K., Grant, A., Nicol, M., Black, J., Mlisana, K., Vanleeuw, L. and Loveday, M., 2017. Drug-resistant tuberculosis in South Africa: history, progress and opportunities for achieving universal access to diagnosis and effective treatment. *South African Health Review*, 2017(1), pp.157-167.
- Cramm, J.M., Finkenflügel, H.J., Møller, V. and Nieboer, A.P., 2010. TB treatment initiation and adherence in a South African community influenced more by perceptions than by knowledge of tuberculosis. *BMC public health*, 10(1), p.72.
- Denton, M., Prus, S. and Walters, V., 2004. Gender differences in health: a Canadian study of the psychosocial, structural and behavioural determinants of health. *Social science & medicine*, 58(12), pp.2585-2600.
- Dijkstra, A.G. and Hanmer, L.C., 2000. Measuring socio-economic gender inequality: Toward an alternative to the UNDP gender-related development index. *Feminist economics*, 6(2), pp.41-75.
- Docrat, S., 2012. An analysis of adherence & equity in access to TB services in Mitchell's Plain, South Africa (Doctoral dissertation, University of Cape Town).
- Dowdy, D.W., Chaisson, R.E., Maartens, G., Corbett, E.L. and Dorman, S.E., 2008. Impact of enhanced tuberculosis diagnosis in South Africa: a mathematical model of expanded culture and drug susceptibility testing. *Proceedings of the National Academy of Sciences*.
- Foster, N., Vassall, A., Cleary, S., Cunnam, L., Churchyard, G. and Sinanovic, E., 2015. The economic burden of TB diagnosis and treatment in South Africa. *Social science & medicine*, 130, pp.42-50.
- Gauld, R., Blank, R., Burgers, J., Cohen, A.B., Dobrow, M., Ikegami, N., Kwon, S., Luxford, K., Millett, C. and Wendt, C., 2012. The World health report 2008—primary healthcare: how wide is the gap between its agenda and implementation in 12 high-income health systems?. *Healthcare Policy*, 7(3), p.38.
- Gebremariam, M.K., Bjune, G.A. and Frich, J.C., 2010. Barriers and facilitators of adherence to TB treatment in patients on concomitant TB and HIV treatment: a qualitative study. *BMC public health*, 10(1), p.651.
- Gilson, L., 2007. with inputs and contributions from the members of the Health Systems Knowledge Network. *Final report of the Health Systems Knowledge Network to the Commission on Social Determinants of Health*.

- Glaziou, P., Sismanidis, C., Floyd, K. and Raviglione, M., 2015. Global epidemiology of tuberculosis. *Cold Spring Harbor perspectives in medicine*, 5(2), p.a017798.
- Goudge, J., Gilson, L., Russell, S., Gumede, T. and Mills, A., 2009. Affordability, availability and acceptability barriers to health care for the chronically ill: longitudinal case studies from South Africa. *BMC health services research*, 9(1), p.75.
- Gray, A. and Vawda, Y., 2017. Health policy and legislation. *South African Health Review*, 2017(1), pp.13-24.
- Hargreaves, J.R., Boccia, D., Evans, C.A., Adato, M., Petticrew, M. and Porter, J.D., 2011. The social determinants of tuberculosis: from evidence to action. *American journal of public health*, 101(4), pp.654-662.
- Hay, S.I., Abajobir, A.A., Abate, K.H., Abbafati, C., Abbas, K.M., Abd-Allah, F., Abdulkader, R.S., Abdulle, A.M., Abebo, T.A., Abera, S.F. and Aboyans, V., 2017. Global, regional, and national disability-adjusted life-years (DALYs) for 333 diseases and injuries and healthy life expectancy (HALE) for 195 countries and territories, 1990–2016: a systematic analysis for the Global Burden of Disease Study 2016. *The Lancet*, 390(10100), pp.1260-1344.
- Hernandez-Garduno, E., Cook, V., Kunimoto, D., Elwood, R.K., Black, W.A. and FitzGerald, J.M., 2004. Transmission of tuberculosis from smear negative patients: a molecular epidemiology study. *Thorax*, 59(4), pp.286-290.
- van den Hof, S., Najlis, C.A., Bloss, E. and Straetemans, M., 2010. A systematic review on the role of gender in tuberculosis control. *Report prepared for Tuberculosis Control Programme (TB CAP). September*.
- Howe, L.D., Hargreaves, J.R. and Huttly, S.R., 2008. Issues in the construction of wealth indices for the measurement of socio-economic position in low-income countries. *Emerging themes in epidemiology*, 5(1), p.3.
- United Nations Inter-agency Group for Child Mortality Estimation (UN IGME), 2017. Levels & Trends in Child Mortality: Report 2017, Estimates Developed by the UN Inter-agency Group for Child Mortality Estimation. United Nations Children's Fund, New York.
- Hugtenburg, J.G., Timmers, L., Elders, P.J., Vervloet, M. and van Dijk, L., 2013. Definitions, variants, and causes of nonadherence with medication: a challenge for tailored interventions. *Patient preference and adherence*, 7, p.675.
- Human Sciences Research Council (HSRC), 2018. The Fifth South African National HIV Prevalence, Incidence, Behaviour and Communication Survey, 2017: HIV Impact Assessment Summary Report. Cape Town, HSRC Press.
- Institute for Health Metrics and Evaluation, 2018. Available at: <http://www.healthdata.org/south-africa> (Accessed: 28 July 2018).

- Issarow, C.M., Mulder, N. and Wood, R., 2018. Environmental and social factors impacting on epidemic and endemic tuberculosis: a modelling analysis. *Royal Society open science*, 5(1), p.170726.
- Kaona, F.A., Tuba, M., Siziya, S. and Sikaona, L., 2004. An assessment of factors contributing to treatment adherence and knowledge of TB transmission among patients on TB treatment. *BMC Public health*, 4(1), p.68.
- Kawachi, I., Subramanian, S.V. and Almeida-Filho, N., 2002. A glossary for health inequalities. *Journal of Epidemiology & Community Health*, 56(9), pp.647-652.
- Khan, M.A., Walley, J.D., Witter, S.N., Shah, S.K. and Javeed, S., 2005. Tuberculosis patient adherence to direct observation: results of a social study in Pakistan. *Health policy and planning*, 20(6), pp.354-365.
- Kilale, A.M., Mushi, A.K., Lema, L.A., Kunda, J., Mukasi, C.E., Mwaseba, D., Range, N.S. and Mfinanga, G.S., 2008. Perceptions of tuberculosis and treatment seeking behaviour in Ilala and Kinondoni Municipalities in Tanzania. *Tanzania Journal of Health Research*, 10(2), pp.89-94.
- Krieger, N., 2003. Genders, sexes, and health: what are the connections—and why does it matter?. *International journal of epidemiology*, 32(4), pp.652-657.
- Krishnan, L., Akande, T., Shankar, A.V., McIntire, K.N., Gounder, C.R., Gupta, A. and Yang, W.T., 2014. Gender-related barriers and delays in accessing tuberculosis diagnostic and treatment services: a systematic review of qualitative studies. *Tuberculosis research and treatment*, 2014.
- Lawn, S. D. and Zumla, A. I., 2011. Tuberculosis. *The Lancet*, 378(9785), pp. 57–72.
- Laxminarayan, R., Klein, E.Y., Darley, S. and Adeyi, O., 2009. Global investments in TB control: economic benefits. *Health affairs*, 28(4), pp.w730-w742.
- Lee, J.H., Sadana, R. and Commission on Social Determinants of Health, 2011. Improving equity in health by addressing social determinants.
- Libman, K., Freudenberg, N., Sanders, D., Puoane, T. and Tsolekile, L., 2015. The role of urban food policy in preventing diet-related non-communicable diseases in Cape Town and New York. *public health*, 129(4), pp.327-335.
- Long, N.H., Johansson, E., Lönnroth, K., Eriksson, B., Winkvist, A. and Diwan, V.K., 1999. Longer delays in tuberculosis diagnosis among women in Vietnam. *The International Journal of Tuberculosis and Lung Disease*, 3(5), pp.388-393.
- Long, N.H., Johansson, E., Diwan, V.K. and Winkvist, A., 2001. Fear and social isolation as consequences of tuberculosis in VietNam: a gender analysis. *Health policy*, 58(1), pp.69-81.
- Lönnroth, K., Castro, K.G., Chakaya, J.M., Chauhan, L.S., Floyd, K., Glaziou, P. and Raviglione, M.C., 2010. Tuberculosis control and elimination 2010–50: cure, care, and social development. *The lancet*, 375(9728), pp.1814-1829.

- MacPherson, E., Richards, E., Namakhoma, I., Theobald, S. and Malawi, R.T., 2012. Dimensions of gender equity in health in East and Southern Africa. *Harare, Zimbabwe: EQUINET, REACH TRUST*.
- Macq, J.C., Theobald, S., Dick, J. and Dembele, M., 2003. An exploration of the concept of directly observed treatment (DOT) for tuberculosis patients: from a uniform to a customised approach. *The International Journal of Tuberculosis and Lung Disease*, 7(2), pp.103-109.
- Marmot, M., 2005. Social determinants of health inequalities. *The lancet*, 365(9464), pp.1099-1104.
- Marmot, M., Allen, J., Bell, R., Bloomer, E. and Goldblatt, P., 2012. WHO European review of social determinants of health and the health divide. *The lancet*, 380(9846), pp.1011-1029.
- Health Systems Trust, 2018. District Health Barometer 2016/2017. Health System Trust.
- Mayosi, B.M., Lawn, J.E., Van Niekerk, A., Bradshaw, D., Karim, S.S.A., Coovadia, H.M. and Lancet South Africa team, 2012. Health in South Africa: changes and challenges since 2009. *The Lancet*, 380(9858), pp.2029-2043.
- Mayosi, B.M. and Benatar, S.R., 2014. Health and health care in South Africa—20 years after Mandela. *New England Journal of Medicine*, 371(14), pp.1344-1353.
- McIntyre, D.I., Thiede, M. and Birch, S., 2009. Access as a policy-relevant concept in low-and middle-income countries. *Health Economics, Policy and Law*, 4(2), pp.179-193.
- Meintjes, G., 2014. Management challenges in tuberculosis and HIV. *SAMJ: South African Medical Journal*, 104(12), pp.885-885.
- Meiring, T., Kannemeyer, C. and Potgieter, E., 2018. The gap between rich and poor: South African society's biggest divide depends on where you think you fit in.
- Montgomery, M.R., Gragnolati, M., Burke, K.A. and Paredes, E., 2000. Measuring living standards with proxy variables. *Demography*, 37(2), pp.155-174.
- Munro, S.A., Lewin, S.A., Smith, H.J., Engel, M.E., Fretheim, A. and Volmink, J., 2007. Patient adherence to tuberculosis treatment: a systematic review of qualitative research. *PLoS medicine*, 4(7), p.e238.
- O'Donnell, M.R., Wolf, A., Werner, L., Horsburgh, C.R. and Padayatchi, N., 2014. Adherence in the treatment of patients with extensively drug-resistant tuberculosis and HIV in South Africa: a prospective cohort study. *Journal of acquired immune deficiency syndromes (1999)*, 67(1), p.22.
- O'Donnell, O., Van Doorslaer, E., Wagstaff, W. and Lindelow, M., 2008. Analyzing health equity using household survey data.
- Obuaku-Igwe, C.C., 2015. Health inequality in South Africa: a systematic review. *African Sociological Review/Revue Africaine de Sociologie*, 19(2), pp.96-131.

- Ong, K.S., Kelaher, M., Anderson, I. and Carter, R., 2009. A cost-based equity weight for use in the economic evaluation of primary health care interventions: case study of the Australian Indigenous population. *International journal for equity in health*, 8(1), p.34.
- Onifade, D.A., Bayer, A.M., Montoya, R., Haro, M., Alva, J., Franco, J., Sosa, R., Valiente, B., Valera, E., Ford, C.M. and Acosta, C.D., 2010. Gender-related factors influencing tuberculosis control in shantytowns: a qualitative study. *BMC Public Health*, 10(1), p.381.
- Pulvirenti, M., McMillan, J. and Lawn, S., 2014. Empowerment, patient centred care and self-management. *Health Expectations*, 17(3), pp.303-310.
- Puoanei, T., Tsolekile, L., Sanders, D., Parker, W., 2008. Chronic Non-Communicable Diseases. In: Barron, P., Roma-Reardon, J. editors. South African Health Review 2008. Durban: Health Systems Trust.
- Raviglione, M. and Sulis, G., 2016. Tuberculosis 2015: burden, challenges and strategy for control and elimination. *Infectious disease reports*, 8(2).
- Iqbal, T., Raziq, M.A., Hussain, Z., Anjum, N., Atiq, S., 2011. Gender Differences among Suspected Pulmonary Tuberculosis Patients undergoing Sputum Smear Microscopy. *Ann Pak Inst Med Sci*, 7(1), pp. 14–17.
- Sabaté, E., De Geest, S., 2003. Adherence to long-term therapies: Evidence for action. *European Journal of Cardiovascular Nursing* 2, 323.
- Sagbakken, M., Frich, J.C. and Bjune, G., 2008. Barriers and enablers in the management of tuberculosis treatment in Addis Ababa, Ethiopia: a qualitative study. *BMC Public health*, 8(1), p.11.
- SANAC, 2017. Let our actions count: South Africa's national strategic plan for HIV, TB and STIs 2017-2022. *The South African National AIDS Council*.
- SARB, 2018. *Quarterly Bulletin*: September 2018. *South African Reserve Bank*, 289.
- Schneider, H., McIntyre, D., Eyles, J., 2012. Researching Equity in Access to Health Care (REACH) Final Technical Report.
- Schwab, K., 2010, September. The global competitiveness report 2010-2011. Geneva: World Economic Forum.
- Sen, G., Östlin, P., 2008. Gender inequity in health: why it exists and how we can change it. *Global Public Health* 3, 1–12.
- Sen, G., Ostlin, P. and Asha, G., 2007. Gender inequity in health: why it exists and how we can change it. In *Gender inequity in health: why it exists and how we can change it*. WHO.
- Shargie, E.B. and Lindtjørn, B., 2007. Determinants of treatment adherence among smear-positive pulmonary tuberculosis patients in Southern Ethiopia. *PLoS medicine*, 4(2), p.e37.

- Shearer, K., Evans, D., Moyo, F., Rohr, J.K., Berhanu, R., Van Den Berg, L., Long, L., Sanne, I. and Fox, M.P., 2017. Treatment outcomes of over 1000 patients on second-line, protease inhibitor-based antiretroviral therapy from four public-sector HIV treatment facilities across Johannesburg, South Africa. *Tropical Medicine & International Health*, 22(2), pp.221-231.
- Shin, H.J. and Kwon, Y.S., 2015. Treatment of drug susceptible pulmonary tuberculosis. *Tuberculosis and respiratory diseases*, 78(3), pp.161-167.
- Smith, C.M., Lessells, R., Grant, A.D., Herbst, K. and Tanser, F., 2018. Spatial clustering of drug-resistant tuberculosis in Hlabisa subdistrict, KwaZulu-Natal, 2011–2015. *The international journal of tuberculosis and lung disease*, 22(3), pp.287-293.
- South African National Department of Health, 2008. National Tuberculosis Management Guidelines 2008. Department of Health, Pretoria.
- Sreeramareddy, C.T., Panduru, K.V., Verma, S.C., Joshi, H.S. and Bates, M.N., 2008. Comparison of pulmonary and extrapulmonary tuberculosis in Nepal-a hospital-based retrospective study. *BMC infectious diseases*, 8(1), p.8.
- Statistics South Africa, 2015. MDG Country Report.
- Statistics South Africa, 2016. *Mortality and causes of death in South Africa, 2015: Findings from death notification*.
- Statistics South Africa, 2017. *Mid-year population estimates*.
- Statistics South Africa, 2018a. *Mid-Year Population Estimates South Africa, Mid-2018*.
- Statistics South Africa, 2018b. *Mortality and causes of death in South Africa, 2016: Findings from death notification*.
- Stewart, F., 2005. Horizontal inequalities: A neglected dimension of development. In *WIDER perspectives on global development* (pp. 101-135). Palgrave Macmillan, London.
- The World Bank, 2018. *GDP per capita, PPP (current international \$)*. Available at: <https://data.worldbank.org/indicator/NY.GDP.PCAP.PP.CD>. (Accessed: 12 July 2018).
- The World Bank, Statistics SA, 2018. Overcoming Poverty and Inequality in South Africa: An Assessment of Drivers, Constraints and Opportunities. World Bank.
- The Global Fund, 2017. Tuberculosis, Gender and Human Rights.
- Thiede, M. and Akweongo, P., 2007. Exploring the dimensions of access. In 'The economics of health equity'. (Eds D McIntyre, G Mooney) pp. 103–123.
- Thorson, A., Johansson, E. and Diwan, V.K., 2007. Tuberculosis and Gender. In *Denmark: WHO European Ministerial Forum*.

- Udwadia, Z.F. and Pinto, L.M., 2007. REVIEW SERIES: The Politics of TB: The politics, economics and impact of directly observed treatment (DOT) in India. *Chronic Respiratory Disease*, 4(2), pp.101-106.
- UNDP, 2015. Discussion Paper: Gender and Tuberculosis.
- UNDP, 2016a. Human Development for Everyone - South Africa, United Nations Development Programme.
- UNDP, 2016b. Human development report 2016, United Nations Development Programme.
- Uplekar, M. and World Health Organization, 2006. The Stop TB Strategy: Building on and enhancing DOTS to meet the TB-related Millennium Development Goals.
- Van Den Boogaard, J., Boeree, M.J., Kibiki, G.S. and Aarnoutse, R.E., 2011. The complexity of the adherence-response relationship in tuberculosis treatment: why are we still in the dark and how can we get out?. *Tropical medicine & international health*, 16(6), pp.693-698.
- Volmink, J. and Garner, P., 2007. Directly observed therapy for treating tuberculosis. *Cochrane Database Syst Rev*, 4.
- Waisbord, S., 2004. Behavioral barriers in tuberculosis control: a literature review. *Washington, DC*.
- Whitehead, M., 1991. The concepts and principles of equity and health. *Health promotion international*, 6(3), pp.217-228.
- World Health Organization, 1985. Targets for health for all. Copenhagen: World Health Organization.
- World Health Organization, 1999. *What is DOTS? A guide to understanding the WHO-recommended TB Control Strategy Known as DOTS* (No. WHO/CDS/CPC/TB/99.270). Geneva: World Health Organization.
- World Health Organization, 2010. Treatment of tuberculosis guideline. 4th edition.
- World Health Organization, 2015. *Global tuberculosis report 2015*. World Health Organization.
- World Health Organization, 2016a. *Global tuberculosis report 2016*. World Health Organization.
- World Health Organization, 2016b. *WHO treatment guidelines for drug-resistant tuberculosis 2016 update*. World Health Organization.
- World Health Organization, 2017a. *Fact Sheet: Cardiovascular diseases (CVDs)*. World Health Organization. Available at: [https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-\(cvds\)](https://www.who.int/news-room/fact-sheets/detail/cardiovascular-diseases-(cvds)) (Accessed: 11 June 2018).
- World Health Organization, 2017b. *Global tuberculosis report 2017.: Leave no one behind - Unite to end TB*. World Health Organization.

World Health Organization, 2018. *Health statistics and information systems*. Available at: http://www.who.int/healthinfo/global_burden_disease/metrics_daly/en/ (Accessed: 6 June 2018).

World Health Organization, 2015. Declaration of Alma-Ata International Conference on Primary Health Care, Alma-Ata, USSR, September 6-12, 1978. *Google Scholar*.

Wyatt, G.E., Thames, A., Simbayi, L., Stein, D.J., Burns, J. and Maselesele, M., 2017. Trauma and mental health in South Africa: Overview. *Psychological Trauma: Theory, Research, Practice, and Policy*, 9(3), p.249.

Zaman, K., 2010. Tuberculosis: a global health problem. *Journal of health, population, and nutrition*, 28(2), p.111.

PART B: LITERATURE REVIEW

Introduction

This chapter includes a review of the research studies and the literature related to the current research objectives. The purpose of this literature review is to set out a theoretical understanding about how the acceptability, availability, as well as affordability of health care services, may influence the equality of access to treatment, particularly through a gender lens; and to review the different methodologies that have been applied in the study of inequality in access to health services primarily in the context of LMICs. The chapter initially introduces the South African health system and the challenge of equity in this system. Then, the chapter explores the concept of equity in health, its importance, and different approaches by which it has been characterised. This section further provides a review of access to health care and various approaches to determine the association between access to health care services and equity in health. The closing part of the chapter explains the comprehensive conceptual framework of access, that has been established by Thiede et al. (2007) and McIntyre et al. (2009), with a particular focus on gender-disaggregated studies. This framework forms the discussion of several studies that have investigated the experienced barriers in accessibility of health care services over three dimensions of access. The references which have been cited in this chapter have been derived from a number of online databases that are broadly used in health economics studies, such as Google Scholar, EBSCOhost, PubMed, and Medline. A set of grey literature inclusive of policy and technical reports has also been included in this chapter. These references are adopted from the releasing agencies or organisations, including the WHO, Statistics South Africa, and The World Bank.

South African Health Sector and the Challenge of Equity

According to research-based evidence, the health of a society relies on access to health care, which is characterised by the affordability of health care services, the availability of those services, and the acceptability of the quality as well as the efficacy of professionals and services to the population (Obuaku-Igwe, 2015). Obuaku-Igwe (2015) has highlighted the determinants of health inequalities as “...a range of social factors such as; race, education, ethnicity, gender, geographical location and income amongst others [while] these factors reflect on and affect

other components of a health system, resulting in poor health outcomes, mortalities and financial losses” (Obuaku-Igwe, 2015, p.97).

The health system in South Africa has been transformed since 1994, after the democratisation of the country (Van Rensburg, 2014). At that time, the agenda for health policy was developed out of the necessity of addressing the highly fragmented health system which existed as the outcome of the unjust system during colonialism and apartheid era that principally took responsibility for serving the needs of the white minority (Coovadia *et al.*, 2009; Jobson, 2015). Before the country's transition to democracy, the health system had been featured with discrimination, disempowerment, and underdevelopment while human and financial resources were ill-distributed, budgets were overspent, and extreme infrastructure disparities were apparent between geographic regions (Coovadia *et al.*, 2009). The African National Congress (ANC) and the new government made a pledge to improve equity as well as social justice, by establishing the ANC National Health Plan and also the White Paper for the Transformation of the Health System in South Africa, that later served as the foundation of the National Health Act No.61 of 2003 (Chetty, 2007). The introduction of the National Health Act reveals that “the socio-economic injustices, imbalances and inequities of health services of the past; the need to heal divisions of the past and to establish a society based on democratic values, social justice and fundamental human rights ... [moreover, it states that National Health Act is enacted] in order to establish a health system based on decentralised management, principles of equity, efficiency, sound governance, internationally recognized standards of research, and a spirit of enquiry and advocacy which encourages participation” (Chetty, 2007, p.4).

Since 1994, the health sector has faced considerable restructuring as well as upgrading in South Africa. The fourteen separate health departments of the apartheid era were merged into one national along with nine provincial health departments (Wadee *et al.*, 2003; Jobson, 2015). In the revised health system arrangement, the National Department of Health (NDoH) set up a new health policy framework whereas provincial health departments were tasked with formulating their particular policy in the context of the national health framework as well as public health service delivery (Coovadia *et al.*, 2009). Primary health care delivery was brought to focus using

the division of health districts as an amalgamated, extensive approach concerning addressing the health demands of the citizens, especially those who were underprivileged (Coovadia *et al.*, 2009). The current South African health care sector consists of a relatively large public sector, a fast-growing smaller private sector along with Non-governmental organisation (NGO) providers (Jobson, 2015). The health care sector accounts for almost 8.8% of national GDP, with a total expenditure of approximately R378 billion during the 2016/17 financial year. Of this total amount, about R182.7 billion is estimated to be spent in the public sector which serves more than 80% of the population while an estimated R189 billion will be spent in the private sector (Veitch, 2017; Fusheini *et al.*, 2018). Despite all the expenditures on health care and government's intentions and policy directives, various factors including poverty, high rate of unemployment, and the heavy burden of infectious diseases have slowed down the health improvements for a high proportion of the population (Fusheini, Eyles and Goudge, 2018). Furthermore, in contrary to the government's covenant to enhance the equity in the South African health sector since 1994, health disparities have persisted due to the failures of stewardship, leadership as well as management, human resource limitations, and incapability in providing a health financing system that contains cross-subsidisation based on income (McIntyre, 2007; Coovadia *et al.*, 2009).

In accordance with South African health indicators, despite reported progress and improvements, not all the health-related MDGs were achieved (Statistics South Africa, 2015). South Africa is one of a few countries whose childhood mortality rate and life expectancy have worsened since the MDGs were set. Moreover, TB and HIV/AIDS epidemics, mental health disorders, maternal and neonatal mortality, and morbidity and mortality resulting from violence and injury are other prominent rationales why the country has failed to meet the health objectives defined during the time of democratisation (Chopra *et al.*, 2009). This tendency is observable in remarkable difference in the rates of mortality as well as the incidence and prevalence of diseases between South African racial groups and also between distinct socio-economic groups; as highlighted by Benatar (2013): "In 2005, infant mortality rates ranged from 18/1 000 live births among white people to 74/1 000 among black people, which was much the same as rates in the early 1990s" (Benatar, 2013, p.154). Moreover, as regards to distributions

of cases of HIV and diarrhoea among different socio-economic groups, Ataguba et al. (2011) have found that the bottom 40% of the population bears approximately 56% of the burden compared to 11% for the top 40% (Ataguba *et al.*, 2011).

Presently, South Africa is facing a key policy and legislative issue of ensuring UHC through National Health Insurance (NHI). This effort is formed on the basis of the democratic right of South Africans to have access to quality health care services which are delivered effectively, efficiently, equitably, affordably and appropriately according to social agreements as well as equity. In this way, health should be viewed as 'a public good and a social investment' (Gray and Vawda, 2017; National Department of Health, 2017).

The Public Health Care Sector

The National Department of Health is directing the public health system and is responsible for overall policymaking and coordination while it is predominantly funded through general taxation. The application and provision of health services are through the 52 districts and nine provinces in South Africa (Coovadia *et al.*, 2009; Massyn *et al.*, 2017). The public health care services consist of primary, secondary and tertiary levels through health facilities, which are placed in and governed by the provincial departments of health (Coovadia *et al.*, 2009). The primary health care clinics, as the basis of the public health system, are the first line of access for patients seeking health care services. The services provided by these clinics are free. Access to health care facilities has enhanced since the democratisation; yet, in many cases, the quality of health services delivered at this level has worsened (Jobson, 2015). District hospitals are the next level of the public health care system in South Africa. Health seekers will be referred from primary health care clinics once they need further specialised treatments. At the tertiary level, the academic hospitals are providing advanced diagnostic procedures as well as treatments. Moreover, these hospitals assume the role of training institutions for health care providers (Jobson, 2015). Approximately 82% of South Africa's total population, a predicted 45 million people, rely on the public health care facilities. However, only 44% of total health care expenditure belongs to this sector (Van Rensburg, 2014; Statistics South Africa, 2017b).

Since 1994, more than 1600 health care facilities have been modernised or built in South Africa (Burger and Christian, 2018). Based on Burger et al. (2012) findings, availability of health services has advanced during the post-apartheid era, as the poor report considerably less time travelling in order to access health care facilities, which means better physical access (Burger *et al.*, 2012). Policies in addressing the affordability barriers in the country have banished the health service fees and broadened the priority health programmes for the purpose of improving the accessibility of health care, mainly in favour of the vulnerable groups (Van Rensburg, 2014; Burger and Christian, 2018). Notwithstanding, a number of recent empirical studies suggest that a sole focus on affordability of health care services will not inevitably advance access to those services, as Brink and Koch (2015) and Koch (2017) found no proof that abolition of user fees raised the probability of disadvantaged groups accessing public health facilities (Brink and Koch, 2015; Koch, 2017; Burger and Christian, 2018). Moreover, Goudge et al. (2009) concluded that better access to public health care may not be guaranteed only by elimination of user fees and that more extensive interventions are required (Goudge *et al.*, 2009). Likewise, Honda et al. (2015) argued that betterments in the availability and affordability of public health care services in South Africa are not expected to enhance the health results if patients find the quality of the services unacceptable (Honda *et al.*, 2015); hence, supposing that public health care services are free, perceived poor quality of health care to clients may prevent them from using those services (Burger and Christian, 2018).

In spite of the fact that the post-apartheid government has made exemplary advancement in restructuring and enhancing the public health care sector as well as developing access to primary care, the health care system continues to be polarised and inequitable (Van Rensburg, 2014), predominantly due to shortage of health care workers and disproportionate distribution between different sectors and geographical areas (Marten *et al.*, 2014). Furthermore, the lack of strong implementation of well-designed health policies developed by the government caused a failure in the translation of those policies to the South African population. Hence, with regards to addressing the issue of achieving health for all people in the country, enhanced leadership and management of policy implementation is required (Coovadia *et al.*, 2009).

The Private Health Care Sector

The private sector covers the health needs of about 16.2% of the South African population, an estimated 8.8 million people, by using 56% of the total health care funds existing in South Africa (Van Rensburg, 2014; Jobson, 2015). The uneven financing of the private sector, concerning the number of beneficiaries, resulted in about eight times greater per capita expenditure in the private sector, as compared to the public sector (Fusheini, Eyles and Goudge, 2018). Mainly made up of general practitioners and specialist physicians who provide their services on a private basis, as well as private hospitals and institutions, the private health care sector is chiefly resourced through voluntary medical schemes (covering 83.5% of total private health expenditure) as well as out-of-Pocket (OOP) payments (covering 13% of total private health expenditure) (Hassim and Heywood, no date; Health Policy Project, 2016). Since there is no financial cross-subsidisation between wealthy and poor in health care financing, the fact that affluent people can spend more on private health care does not affect public sector financing, and the distribution of benefit is still unjustly skewed to the upper-class quintiles who endure the lowest burden of disease (Harrison, 2009). The proportion of medical aid beneficiaries has remained practically unchanged since 1998, mainly as the result of unaffordability of private medical aid while the OOP expenditure for patients seeking treatment through the private health sector has increased (Harrison, 2009). The development of the private sector is highly dependent on the growth of the real income of the general population, while supplying services for public sector through Public-Private Interactions (PPIs) can be considered as an alternative mechanism for growth (Harrison, 2009).

South Africa has about 83 registered medical aid schemes which fund health services for approximately 8.8 million members. Due to the regressive financing incidence in the private sector, the poorest 20% of medical aid contributors devote twice as much of their income as the wealthiest 20% (Harrison, 2009; Health Policy Project, 2016). Moreover, there are 238 private hospitals in South Africa, that are unequally distributed across the country, as 188 hospitals are located in wealthy urban areas with the greatest supply and only 50 hospitals are located in rural areas (Jobson, 2015; Health Policy Project, 2016). The Private sector has been criticised as responsible for profound unequal distribution of health workers across South Africa, as nearly

70% of medical practitioners are working in the private health care sector (Passchier, 2017). These disparities restrain a considerable proportion of South Africans from financial and geographical access to health care services, consequently increasing health inequalities and threatening the country's efforts with regards to attaining UHC (Fusheini, Eyles and Goudge, 2018).

Health Care Financing in South Africa

In South Africa, health care is funded by means of consolidation of mechanisms (Ataguba and Akazili, 2010). Although financing the majority of health expenditure is from the country's National Revenue Fund, the country has made strategic use of international aid, mainly in assisting its war against HIV (UNICEF, 2017). With regards to revenue collection and contribution in the year 2015, 49.8% of total health expenditure (THE) was funded by private resources, 48.3% by public resources, and 1.9% by donors. The NDoH and provincial departments account for 2.5% and 87% of government health expenditure (GHE), respectively. OOP expenditure at 13.0% and medical scheme at 83.5%, account for the majority of private health expenditure (Health Policy Project, 2016). Public hospitals charge user fees, differentiated based on income level. In a number of medical schemes, beneficiaries were asked to pay co-payments to health care providers for certain services which are not included in the benefits package (Health Policy Project, 2016). In recent years, the contribution of donor funding to the budget of the NDoH has ranged from 2.2% to 3.2%, and has declined to 1.3%, in 2017 fiscal year (UNICEF, 2017). In the case of pooling, as it is mentioned previously, the country has 83 private medical aid schemes that finance health care services for approximately 16% of the population who are predominantly formal sector workers and, occasionally, their dependents. The rest of the population are reliant on tax-funded health services, which allows for a large risk pool, enabling people who cannot pay for care to receive it (Health Policy Project, 2016). In terms of purchasing, tax-funded services are composed of an extensive health package. South Africans have been offered a broad range of services, from primary to specialised health care. Private schemes provide key services from the prescribed Minimum Benefits Package (MBP). The NHI benefits package has yet to be precisely determined, but private medical aids would probably cover additional services which are not included in the NHI package. NHI would also organise a transitional fund to purchase primary

health care services from certified public and private providers, likewise would eradicate user fees in public hospitals (Health Policy Project, 2016).

Equity in Health

Over the last few decades, there has been ample recognition of the importance of equity as one of the primary goals for health systems and an enormous literature is available on the subject. There exists irrefutable evidence on differences in the health profiles of various nations and even distinct groups within the same country, mostly rooted in socio-economic disadvantage and geographic location (Whitehead, 1991). These differences are made discernible through the existence of higher premature mortality rates, lower chances of survival, higher burdens and preceding onset of infectious as well as chronic diseases along with accrued disability among disadvantaged groups (Whitehead, 1991). Moreover, patients of lower SES evidently consume fewer health care services, irrespective of their health demands, and allocate a higher percentage of their earnings as OOP payment on seeking therapies which usually drives them into further impoverishment. This phenomenon is called the 'medical poverty trap' (Whitehead, 1991; Ostlin *et al.*, 2005).

Since the World Health Organisation's Alma-Ata Declaration of 1978 which raised the necessity of improving the health of underprivileged groups through primary health care and preventative programs, equity has become a primary goal for international public health policy and planning (Ong *et al.*, 2009). In 1986, WHO broadened their views and clarified what is meant by health equity: "[a situation in which] everyone should have a fair opportunity to attain their full health potential and, more pragmatically, that no one should be disadvantaged from achieving this potential, if it can be avoided" (WHO, 1986; Whitehead, 1991, p.7). In the same vein, Braveman and Gruskin (2003) have described health equity as "... the absence of systematic disparities in health (or in the major social determinants of health) between groups with different levels of underlying social advantage/disadvantage" (Braveman and Gruskin, 2003, p.254). However, there continues to be an ambiguity revolving around the sphere in which the notion of equity is defined. Some people consider disparities in the health status of different groups of people while others are arguing about injustices in the supply as well as the distribution of health care services among a population (Whitehead, 1991).

As the most consistent and dominant aspect of all literature, the inequalities which are unnecessary, unavoidable, unfair and unjust are the leading cause of health inequity, moreover in order to define health differences as inequitable, the causes of these inequalities have to be judged unfair, morally and ethically (Whitehead, 1991; Braveman and Gruskin, 2003; Ong *et al.*, 2009). As it has been mentioned by Whitehead (1991) "Human beings vary in health as they do in every other attribute" (Whitehead, 1991, p.6), health differences are only tagged as inequitable if individuals have no direct control on their health status due to the circumstances. Whitehead (1991) introduced four essential determinants of inequitable health differences: "(1) health-damaging behaviour where the degree of choice of lifestyles is severely restricted; (2) exposure to unhealthy, stressful living and working conditions; (3) inadequate access to essential health and other public services and; (4) natural selection or health-related social mobility involving the tendency for sick people to move down the social scale" (Whitehead, 1991, p.5).

Taking into account all definitions and discussions related to equity, specifically in terms of health and health care, this fact is clear that health equity can only be obtained if there is an equal chance for individuals to gain health (Whitehead, 1991). This perception reveals the importance of access to health care services. Under the circumstances that health care services are the solution by which individuals can maintain and enhance their health status, equity in health is contingent on equity in access to those services. Oliver and Mossialos (2004) have counted significant health equity principles as follow: equal access to health care for equal need; equal utilisation of health care for equal need; and equal health outcomes (Oliver and Mossialos, 2004). As explained by them, "Equal access for equal need requires conditions whereby those with equal needs have equal opportunities to access health care (that is, horizontal equity), and, as a corollary, those with unequal needs have appropriately unequal opportunities to access health care (that is, vertical equity)" (Oliver and Mossialos, 2004, p.655). Nevertheless, this fact is undeniable that individuals with same need and fair opportunities to access health services might not make equal use of their opportunities, for instance as a result of different individual preferences (Oliver and Mossialos, 2004; McIntyre *et al.*, 2009). Krasnik (1996) also considered fair resource allocation as an essential factor to achieve the highest level of health equity, when needs-based models are used. Three elements of fair resource allocation are as follow: equity in

access, utilisation, and quality of care in respect to health demands, whereby need is defined based on the capacity to benefit from care (Whitehead, 1991; Krasnik, 1996; Mooney, 2009). Therefore, as a principal foundation to attaining the equity in health care, superior health care services should be accessible for all individuals. From this perspective, equity policies related to the health sector should be promoted in order to improve access to and control the quality of care by checking the following factors: (a) geographical distribution and resource allocation of health services in relation to measures of need and access in each area; (b) causes for inadequate uptake of essential services by diverse social groups in their efforts to gain access to health facilities and; (c) quality of health care along with acceptability as culture-related dimension of access (Whitehead, 1991).

In spite of strong commitment to health equity since 1978, reflected in World Health Organisation's Alma Ata Declaration and using a comprehensive primary health care (PHC) model which resulted in growth of primary health care enterprises globally, numerous individuals in settings with limited resources still do not gain equitable access to primary health services (Braveman and Tarimo, 2002; Ong *et al.*, 2009). Primary health care framework did not attain its goals for various reasons, inclusive of the refusal of politicians and experts in developed countries to accept the truth that each community needs to participate in planning and implementation of their health care services. Moreover, affluent nations have been able to follow equity policies with fewer efforts in comparison with poorer nations, whose progress in adopting health equity-related policies has been restricted by appearance and swift growth of communicable diseases, shortage of human resources due to globalisation along with poor management and monitoring that hampered the health policies from being successfully implemented (Hall and Taylor, 2003; Chetty, 2007; Coovadia *et al.*, 2009). The PHC model failure in achieving its equity goals concurrent with some shifts in economic philosophy encouraged the substitution of PHC by 'Health Sector Reform' approach. This approach was more focused on delivering health services by using private sector rather than governmental services (Hall and Taylor, 2003). Nevertheless, macro-economic policies also hindered the health sector reforms from tackling health inequities especially in LMICs, as Whitehead *et al.* (2001) also mentioned, "The actual outcomes of previous and current market-oriented reforms have often been contrary to stated objectives, as economic

access for poor people has declined, and total costs have increased” (Whitehead *et al.*, 2001, p.835; Hall and Taylor, 2003; Gilson *et al.*, 2007).

Equity in Health Care Services

Health services, either preventive or treatment, are the mediums through which individuals are granted the chance to maintain and improve their health status, and consequently are critical components in enhancing the health of the individuals as well as the population (Krasnik, 1996; Rosenstock, 1996). Blaxter (1983) has described health care services as a protection against the effects of impoverishment, by considering the role of health services with respect to primary prevention, curative medicine or secondary prevention, and rehabilitative medicine or tertiary prevention (Blaxter, 1983). Mooney (1982) also has presented seven possible definition of equity from which two principal perspectives regarding to a clear definition of ‘equitable health services’ can be derived: (a) equity in health services is achieved when applicable health-related budget is allocated on equal terms amongst geographical areas in accordance with the population's size in those areas; further (b) equity in health is fulfilled when there exists equality in the all individuals' health status (Mooney, 1982; Whitehead, 1991). There have been many criticisms of these views from different perspectives, suchlike in the first case, even if the equitable health care budget allocation were achieved, it would not guarantee that different groups with distinct needs for health care services are able to meet their needs; moreover, with respect to second view, as health care is just one of the numerous factors which contribute to health inequalities in a setting, acting in isolation might not be able to necessarily accomplish the desired improvement in entire population health status (Whitehead, 1991).

As defined by Aday et al. (1980), equity in health service distribution will be achieved if ill-health is the primary consideration in the allocation of resources (Aday, Andersen and Fleming, 1980). They further characterised equitable access to health care services as a circumstances in which "services are distributed on the basis of people's need for them" (Aday and Andersen, 1981, p.6). Based on this definition, Krasnik (1996) has described an equitable allocation of health services as: "... [a distribution] in which the amount of health care received correlates closely with indicators of need and is independent of variables such as income, which are irrelevant to need" (Krasnik, 1996, p.3). Krasnik further argued that in order to use such definitions in health services

research a number of variables related to the distribution of medical care, need, and other major determinants of health should be considered. For instance, the distribution of medical care is mostly measured by the amount of utilisation (Krasnik, 1996). With a view to presenting a practical definition concentrated on acceptability, quality, and accessibility of the health care provided to all sections of the population, equity in health care is redefined by Whitehead (1991), as: (a) equal access to available care for equal need; (b) equal utilisation for equal need and; (c) equal quality of care for all (Whitehead, 1991). Thereafter, access to and utilisation of health care services as two interconnected concepts, have been dominantly involved in health system equity research and policy.

This fact is clear from all works of literature on health and health care equity that equity in health can only be obtained if each person has the opportunity to achieve the maximum possible level of health. This perception reflects the predominant role of access; if the health services are the solution through which individuals and populations can improve their health status, then it indubitably follows that equity in health is in reliance on equity in access to health care services (Krasnik, 1996). On that account, in order to appropriately discuss the equity in health and health care service, a profound understanding of the concept of access is necessary.

Access to Health Care Services

In the face of a considerable body of research committed to identifying an applicable concept of access, a definition by which accessibility of health care services can be taken beyond the theoretical principle remains absent. Shedding light on the ambiguity of the term ‘access to health care’, and presenting a commonly accepted definition of that, particularly with regards to being operationalised to evaluate health systems in LMICs, was noted as a necessity by several studies (Oliver and Mossialos, 2004; McIntyre *et al.*, 2006; Thiede *et al.*, 2007). As highlighted by Thiede *et al.* (2007), “without greater clarity on the concept of access, it is impossible to pursue accessible health systems actively”, specifically in contemporary evidence-based policy-making, where “...if the access concept is not well understood, comprehensive evidence on what should be done to promote equitable health systems cannot be gathered” (Thiede *et al.*, 2007, p.104). Moreover, in spite of recurrent reference to ‘equitable access to health care services’ and the fact that formulation of the concept of ‘access’ is considerably dependent on the context in which

the analysis is taking place, the absence of particular meaning of this notion is problematic for governments, leaving them without a reference point for evaluating their health-related policies (Goddard and Smith, 2001; Oliver and Mossialos, 2004). Additionally, current debates around the concepts of 'individual empowerment' as well as 'informed choice', which accentuate the importance of individual autonomy in decision-making, has expanded the ways by which equity and access have been traditionally described (Gulliford, 2009).

Conventionally, there have been four approaches concerning evaluating access to health care services, and each approach has placed different levels of importance on those concerns related to supply and those related to demand for health care services. Interpreting access exclusively from the supply-side dimension is the first approach in which distribution of health care resources to different regions is generally based on a range of specific factors such as population size, local input costs, and health care needs (Oliver and Mossialos, 2004). As McIntyre et al. (2009, p.182) discussed, from this perspective, access is merely sighted as a matter of location primarily measured by provider-to-population ratios while situating a provider in a community does not necessarily promise that people are empowered to get the health service they need. Hence, this approach wherein the 'availability of service' or 'spatial accessibility' is used as the only proxy for access has been criticised for being essentially simple (McIntyre *et al.*, 2009).

A second approach through which access to health care is conceptualised has placed greater importance on the demand side by referring to patients' ability to pay for health services (Oliver and Mossialos, 2004). Within this approach, affordability of health care service is seen as the unique proxy for access by which the connection between costs of the services and the patient's ability to pay for those services according to their income, insurance coverage as well as eligibility criteria for government's health grants were considered (Penchansky and Thomas, 1981; McIntyre *et al.*, 2009). Although, as Gulliford et al. (2002) has mentioned, "The impact of user charges and other costs of accessing care affect different socio-economic groups in different ways. For some groups, access may not be compromised, whereas for others, costs may represent a significant deterrent." As a corollary, same costs do not inevitably provide equal access, and the magnitude of the health service costs along with the user's ability and willingness

to pay are influential factors on access to health care services (Gulliford *et al.*, 2002). Furthermore, monetary incentives to health care providers can impact the availability of health care services as well as the quality of those services mainly where providers can choose to offer mixed public-private care (Gulliford *et al.*, 2002; Birch and Anderson, 2005).

In the third approach which has a place in most referenced views of access to health care in recent years, access has been indicated in terms of health service utilisation (Penchansky and Thomas, 1981; Goddard and Smith, 2001; Ricketts and Goldsmith, 2005; McIntyre *et al.*, 2009). Opportunely observed by Donabedian (1972), many individuals who have shared this viewpoint trust that "the proof of access is the use of service, not simply the presence of a facility" (Donabedian, 1972; Gulliford *et al.*, 2002, p.187). From this angle, use of service is analysed both in respect of absolute terms that covers actual use of services as well as the relative terms such as different level of health services utilisation across groups with distinct health demands (McIntyre *et al.*, 2009). Andersen, Aday and Newman, as pioneers of this approach, formulated a framework that has been extremely influential in developing health policies (Donabedian, 1972; Andersen and Newman, 1973; Aday and Andersen, 1974; Ricketts and Goldsmith, 2005). Although the framework has evolved with the years, this approach substantially relates the utilisation of health care services to particular sorts of access, comprised of efficient, realised, potential, as well as effective access (Daniels, 1982; Anderson, 1995; Ricketts and Goldsmith, 2005; McIntyre *et al.*, 2009). Through this framework, Anderson (1995) presents the notion of potential accessing to health care services as being utterly reliant on predisposing and facilitating elements that are related to the processes as well as the structure of each health system (Anderson, 1995; McIntyre *et al.*, 2009). Despite the fact that their framework has been an essential foundation for many of the academic essays in terms of recognition and evaluating access to health care services, yet its limitations cannot be overlooked. Rendering access as service utilisation suggests that an individual who either did not use health care services or used different services for the identical health needs had unequal access to health services. However, as it has been explained by McIntyre *et al.* (2009) this statement would only hold true if other elements of the relationship between demand and supply, inclusive of health seekers' principal health beliefs, values, and attitudes on health as well as health care services were identical

(Anderson, 1995; McIntyre *et al.*, 2009). Moreover, as pointed out by Daniels (1982), this method is not comprehensively capable of considering equity in access to health services, since “... a focus on utilisation rates ignores at least one other necessary condition for equity of access” (Daniels, 1982, p.60). Their approach does not demonstrate how process variables like OOP health care expenditures and waiting time can represent a greater burden to some, especially in the case of constant utilisation rates (Daniels, 1982). Furthermore, measuring the ‘utilisation’ may not be an appropriate measure of the quality of health care service or there may be alternative therapies that are equally effective but not considered, hence the under-utilisation of a unique therapy may simply denote use of alternative therapies (Daniels, 1982; Goddard and Smith, 2001).

A fourth approach has interpreted access as the full cost or shadow price of using a health care service. The shadow price includes all costs associated with using services like the cost of travelling to visit a physician and waiting time for services besides any price at the point of delivery (McIntyre *et al.*, 2009). As Le Grand (1991) argued, the shadow costs of using health services should be interpreted as opportunity cost and are highly dependent on the context where the cost is carried (Le Grand, 1991; McIntyre *et al.*, 2009). The opportunity cost framework has introduced an affordability factor, yet in its broadest term of the available opportunity sets to the individual as well as the supply-side effect of cost or shadow price. In this concept, the influences of both supply and demand-side are individualised. Furthermore, this framework embodies other aspects of access alongside the ones which are broadly taken into account through published literature on the conceptualisation of access (McIntyre *et al.*, 2009); as for instance, “ensuring that services are available and affordable would not be sufficient to ensure access to care if service providers were predominantly male in countries where at least part of the population believed it inappropriate for women to be examined by male physicians” (McIntyre *et al.*, 2009, p.183). In such circumstances, women as health seeker are incurred by opportunity cost in terms of community acceptability and self-esteem coupled with opportunity cost related to the shadow price of care (McIntyre *et al.*, 2009). Although a number of authors have adopted this framework, complexities in attributing the approach of opportunity cost approximation has driven a number of authors to apply the straightforward supply-side estimates (McIntyre *et al.*, 2009).

As demonstrated by the majority of theoretical literature about the notion of access, the concept itself is composed of a broad range of elements, which are mostly correlated. Furthermore, several approaches have been proposed to assess the access to health services, some focusing on either supply-side or demand-side, others on both supply- and demand-side. Thiede et al. (2007) have developed one of the most recent studies of access, specifically in the context of LMICs, which has been further described by McIntyre et al. (2009) (Thiede *et al.*, 2007; McIntyre *et al.*, 2009). They have defined access as “the freedom to use health services” (Thiede *et al.*, 2007, p.105); moreover, they have provided a conceptual framework that describes access as the empowerment of an individual to use and benefit from health care services. In this way, regarding equitable accessibility to health care services for all citizens, policy-makers are responsible for going further than merely ensuring those services are available within a given setting; they are supposed to make sure that individuals are empowered to choose and use their required services at the time of need (McIntyre *et al.*, 2009).

According to mentioned framework ‘utilisation of health care’ is not the absolute proxy for equity in access, but equitable access to health care can be obtained “...if adequate information on health, information on appropriate health care responses and on the opportunities to use health services accordingly is effectively communicated across communities” (Thiede *et al.*, 2007, p.105). This framework, as illustrated in Figure 1, further presents access to health care as a multidimensional concept in accordance with the interplay among the health systems (as supply-side) and patients (as demand-side). Hence, access to specific health service is led by the ‘degree of fit’ among the individuals and the health system across all elements influencing the freedom to use health care services (Thiede *et al.*, 2007; McIntyre *et al.*, 2009). Although, the notion of ‘compatibility’ or ‘degree of fit’ among the individuals and health systems was firstly applied by Donabedian (1973) and Penchansky (1977), suggesting that the ‘one size fits all’ description is not fitting in health-related policies, it became the basis of access concept in the conceptual framework presented by McIntyre et al. (2009) which grants the empirical examination of access by classifying factors into three dimensions: affordability, availability, and acceptability (McIntyre *et al.*, 2009).

Three Dimensions of Access and Implications for Equity

Each one of the three dimensions of access is distinct and is concerned with a set of particular issues: affordability is predominantly focused on features tied to financial access; acceptability

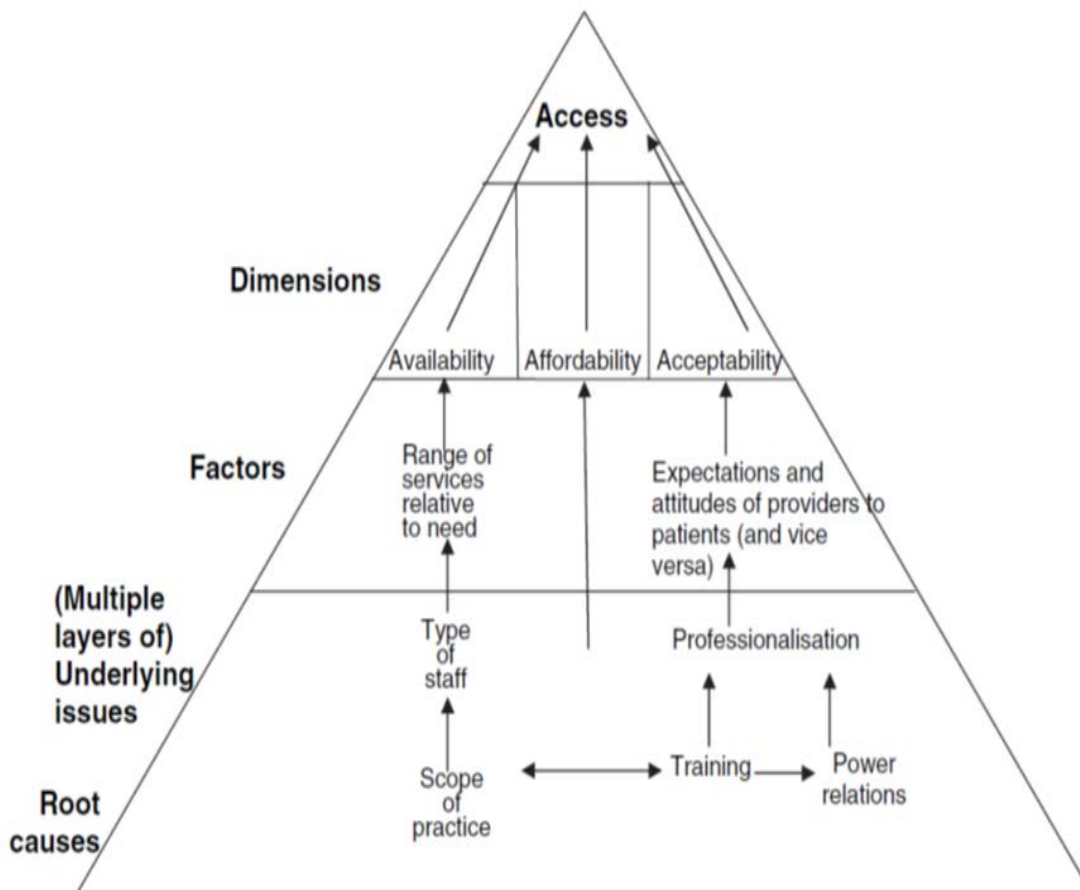


Figure 1. Access evaluation framework (McIntyre *et al.*, 2009).

is primarily involved in cultural and social-related factors of access and; availability is mostly dealing with elements regarding physical access. However, these mentioned dimensions are highly interconnected, and access is determined by the interaction between these dimensions (Thiede *et al.*, 2007; McIntyre *et al.*, 2009).

Acceptability

Acceptability, which mainly assigns to the nature of service provision and the way in which this is comprehended by both providers and patients, is the most overlooked dimension of access in the empirical literature, yet systematic inequalities in utilisation of health care services have been

shown to be moderately associated with acceptability barriers among different settings which are evidential of its importance, specifically in terms of discussions on equity-focused health policies (Gilson, McIntyre, *et al.*, 2007; Thiede *et al.*, 2007). This dimension, at the provider/system level, is mostly focused on the fit between attitudes of health care provider towards patient characteristics (such as gender, age, race, language, and SES) and individuals' attitudes towards provider characteristics which are under the effect of a number of factors such as type of provider, gender, age, race, language, etc. which will affect the nature of patient-provider interaction and ultimately the patient's ability or freedom to receive care (Thiede *et al.*, 2007; McIntyre *et al.*, 2009). Furthermore, acceptability at the individual level is concerned with a number of factors inclusive of social stigma around diseases, health literacy, and other sociocultural features (like gender-related roles and status in the family/community) (Yang *et al.*, 2014).

One of the influential factors with regards to the acceptability of health services is the interaction between expectations of providers and individuals and the degree to which both parties respect each other's expectations. For instance, providers usually expect the patients to respect their professional status and follow their prescribed treatment while patients expect the provider to treat them respectfully, undertake a complete examination, explain their disease as well as available treatment alternatives. Patients also have other expectations related to health service organisations such as efficiency in the process of using services, respecting patients' privacy, and avoiding stigmatisation (Thiede *et al.*, 2007; McIntyre *et al.*, 2009). Gilson *et al.* (2007) have also described this dimension as intimately associated with the trust between patient and provider. Through this lens, the concept of accessibility includes the fit between 'lay health beliefs' and 'professional health beliefs' along with the engagement and dialogue between patients and health providers (Gilson, McIntyre, *et al.*, 2007).

The Matter of Fit between 'Professional Health Beliefs' and 'Lay Health Beliefs'

Lay concepts of illness include individual's perception of their symptoms, disease and appropriate treatment alternatives as well as their effectiveness. These beliefs may have emerged from local and historical contexts, personal experience and observation, and whether lay publics are considering the health and illness about their own or in general (Macintyre, McKay and Ellaway,

2006; Gilson, McIntyre and Mooney, 2007). Generally, health care systems, where professional health beliefs are mostly rooted from, have been based on the biomedical model of medicine which commonly defines disease with consideration of pathology, biochemistry and physiology aspects (Gilson, McIntyre and Mooney, 2007). As a corollary of this fact, social determinants of disease are much disregarded causing a vast difference in the health beliefs of patients and providers. This divergence generated a widespread mistrust between providers and many lay-populations that has a widely recorded effect on the way that individuals seek medical treatment (Gilson, McIntyre and Mooney, 2007).

In a qualitative study of patient adherence to TB treatment, Munro et al. (2007) conducted a systematic review of provider's and patient's visions of adherence to treatment. They found that patients refused to accept that they were infected by TB as a result of their distrust in the validity of the diagnostic methods as well as the medical system; moreover, some patients refused to take medication as they felt it doesn't do any good for their health (Munro *et al.*, 2007). In most cases, this refusal caused poor adherence where treatment was discontinued as soon as symptoms had faded. The authors further illustrated that in many instances, TB treatment was not even started as a result of false perceptions on side effects of treatment (Munro *et al.*, 2007).

Patient-provider Dialogue and Engagement

The quality of communication between patient and provider has considerable potential for hindering patients from seeking health care mainly through discrimination, provider attitudes towards patients, and issues related to patient privacy that evidently have a terrific effect on the level of trust between health providers and patients (Gilson, McIntyre and Mooney, 2007). By its very nature, the patient-provider interaction entangles a complicated power dynamic, where providers are capable of using their communication practices in order to exercise power over patients (Gilson, McIntyre and Mooney, 2007). A vast body of literature has studied the impact of such interaction on acceptability dimension of access to TB treatment.

In a cross-sectional study, conducted by Ibrahim et al. (2014), the provider's knowledge and attitudes towards TB patients under the DOTs treatment in Nigeria has been investigated. Based on their findings, lack of awareness of the health care workers on the management of TB patients

and poor interpersonal interaction with patients have an adverse effect on patients adherence to TB treatment (Ibrahim *et al.*, 2014). In a similar strain, Noé *et al.* (2017) have conducted a descriptive, cross-sectional study by using a specifically designed Knowledge, Attitudes and Practices (KAP) questionnaire in the district of Manhica which is a high TB burden rural area in Southern Mozambique (Noé *et al.*, 2017). Their findings indicated that more than seventy per cent of respondents had never heard of Xpert MTB/RIF as a TB diagnostic test. Moreover, less than fifty per cent of respondents correctly approved that paediatric TB was more challenging to diagnose compare to adult TB and less than twenty-five per cent of respondents accurately determined the dissimilarity of required treatment time between adults and children. About 70% of participants admitted that there was a stigma associated with TB from which about 48% agreed that this stigma was greater than HIV-associated Stigma (Noé *et al.*, 2017). The authors concluded that the provider's knowledge gaps and their stigmatising behaviour disclosed in this study might induce inferior patient care (Noé *et al.*, 2017).

Considering previous discussions around the beliefs of health professionals and lay public about different aspects of health in addition to the level of engagement and dialogue between them, it is an undeniable fact that good information promotes the 'fit' between individuals and the health system (McIntyre *et al.*, 2009). In a general sense, imbalance of information generates power relationships unequally distributed between patients and providers which can dramatically influence each access dimension, for instance, providers' eagerness to involve the patient in making treatment decisions can highly affect the acceptability of health service (McIntyre *et al.*, 2009). Acquiring an acceptable level of health literacy and consequently being well-informed, is the result of effective communication between patients and providers which is directly linked to health outcomes (Thiede *et al.*, 2007; Batterham *et al.*, 2016). In terms of acceptability dimension of access, information of patients' rights can direct their expectations of providers and the extent to which providers respond to these expectations. Moreover, providers' awareness of cultural beliefs in the local community may help them to adapt services appropriately and improve the acceptability of service (Thiede *et al.*, 2007; McIntyre *et al.*, 2009).

Health Literacy and Stigma

The association between low literacy skills and health status has engendered the emergence of the concept of health literacy, although the definition of this concept has continually evolved in recent years (Nutbeam, 2008; Easton, Entwistle and Williams, 2013). Zarcadoolas et al. (2005) defined health literacy as “the wide range of skills and competencies that people develop to seek out, comprehend, evaluate and use health information and concepts to make informed choices, reduce health risks and increase quality of life” (Zarcadoolas *et al.*, 2005, p.196). Moreover, health literacy which provides individuals with knowledge and confidence to access, use and navigate health and social care information and services, has a principal role in control of any disease and is highly related to the health outcomes (Easton, Entwistle and Williams, 2013; Roberts, 2015; Daftary *et al.*, 2017). In the causal pathway between health literacy and health outcomes, mediators are the factors that explain all or part of the correlation. Level of patient self-efficacy, knowledge, value and norms, disease-related as well as poor literacy-related Stigma are among those factors that can mediate the (direction or magnitude of) association between health literacy and some health outcomes, such as adherence to treatment (Berkman and Donahue, 2011).

In a qualitative study conducted by Easton et al. (2013) the effect of low-literacy-related stigma on patient-professional verbal interactions and health outcomes were investigated (Easton, Entwistle and Williams, 2013). According to their findings, the stigma of low literacy had a significant adverse impact on patient-provider verbal interactions. Several communication difficulties were worsened since participants limited their dialogue with health care professionals and used different approaches to hide their poor literacy that could send false signals to providers. In conclusion, they highlighted the fact that low-literacy-related stigma can severely weaken patient-provider interaction and patients' potential to benefit from health services (Easton, Entwistle and Williams, 2013).

At the individual level of acceptability, mostly in terms of social stigma around TB infection, there exists an extensive literature, including gender-disaggregated analyses. In a systematic review of qualitative studies, Krishnan et al. (2014) have explored gender-related barriers and delays in accessing TB Services (Krishnan *et al.*, 2014). Their findings affirmed that TB-related stigma, which

is highly overlapping with limited health literacy, is a principal barrier to accessing TB services in most settings. This stigma extensively affects both genders, with women expecting greater stigma with family members and lack of proper care from them whereas men dealing with more workplace as well as community stigma. Furthermore, women reported higher psychosocial corollaries of TB stigma such as feelings of isolation, fear of divorce or compromised marriage prospects, in case of being unmarried, and were more likely to conceal their TB status or delay seeking treatment as a result of stigma (Krishnan *et al.*, 2014). Likewise, Onifade *et al.* (2010) in their qualitative study on gender-related factors influencing TB control in Shantytowns found that women reported feeling the burden of TB-related stigma more intensely than men. Hence, most tried to hide their diagnosis due to fear of rejection as well as isolation, and a number of other women mentioned they had been discriminated against because of their diagnosis while men were indifferent about the opinion of others (Onifade *et al.*, 2010).

Considering all the above discussions on acceptability dimension of access, this fact is clear that ensuring the individual's empowerment to use health care services is a critical factor in achieving public health goals particularly those that rely on treatment adherence. Acceptability barriers generally emerge in a situation that health care services are organised from the perspective of the system and its providers, instead of the perspective of patients (McIntyre *et al.*, 2009).

Affordability

The affordability dimension of access, have recently dominated the debate around equity in health care, especially for populations living within LMICs. The concept of affordability represents an individual's financial access to health services by examining the goodness of fit between the full costs of seeking care to the patients using the health services and their ability-to-pay for these services, generally reflected by their SES (McIntyre *et al.*, 2006; Thiede *et al.*, 2007). This dimension further explores the potential effect on household well-being of spending the household budget to pay the expenses of health care services (McIntyre *et al.*, 2009). McIntyre *et al.* (2006) has presented a diagram in order to illustrate key subjects in the emerging experience of the economic consequences of ill-health and using health services (outlined in Figure 2), particularly within the context of LMICs, that generally fall into two main categories, *videlicet*, direct and indirect costs (McIntyre *et al.*, 2006; Thiede *et al.*, 2007).

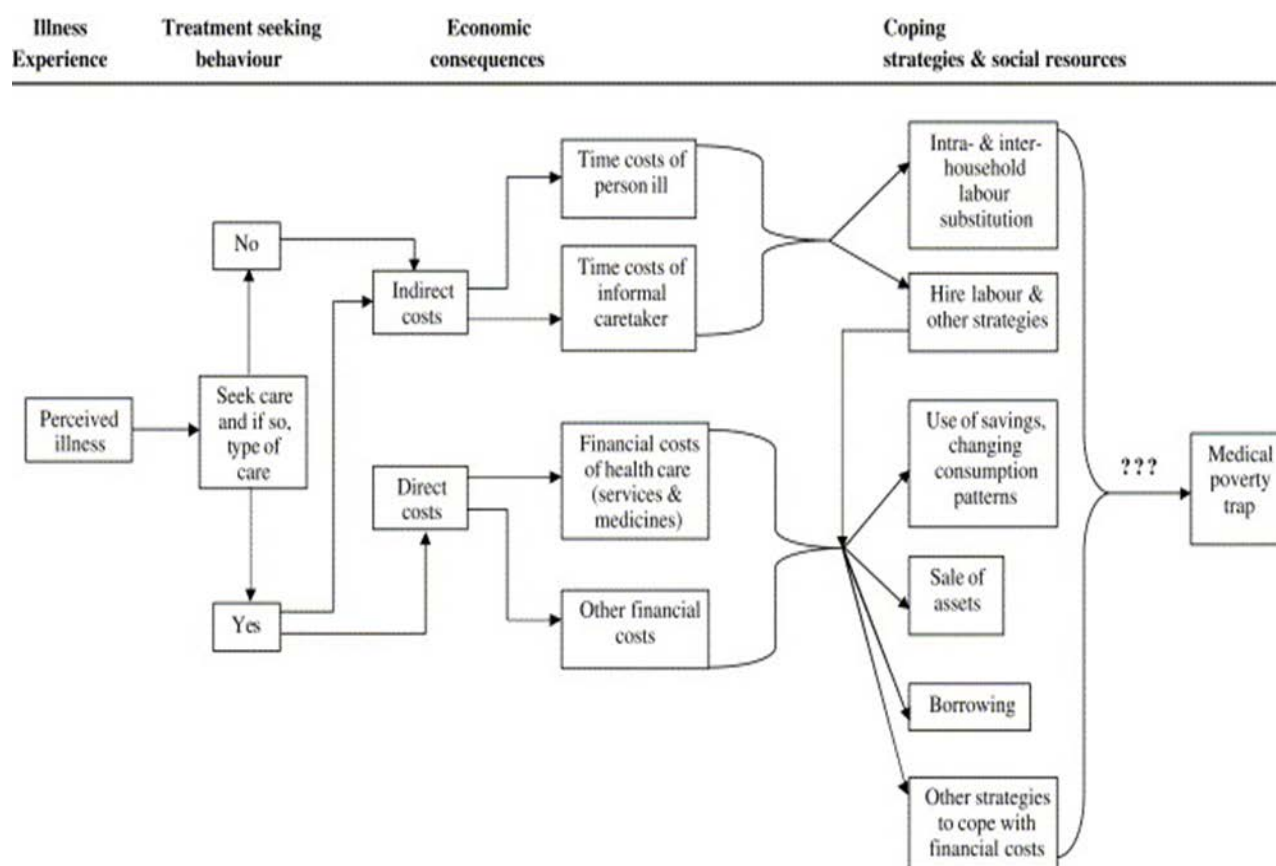


Figure 2. Clarified diagram of essential issues connecting to the economic consequences of ill health (McIntyre *et al.*, 2006).

Direct and Indirect Costs of Illness

Regarding measuring the economic cost of illness (COI) and evaluating the affordability of health service in the public health field, two various indicators have constantly been used: (a) health care expenditure as a proportion of total household income, also known as direct cost burden; (b) production and income loss due to illness as a proportion of 'normal' income, also known as indirect cost burden (Russell, 2005; Jo, 2014).

Being borne by patients, their family and ultimately health systems, the direct cost of illness refers to the range of health care and non-health care costs. The former typically includes official consultation fees (OOP payment or co-payment in case of being insured); unofficial or 'under-the-counter' payments; cost attached to diagnostic tests as well as medicine charges and; fees

attached to hospitalization suchlike pre-admission payments, ward and theatre costs; while the latter is the costs of non-health items which require direct payment inclusive of transportation, particular food or special dietary requirements following treatment as well as child-care costs when seeking health care (Thiede *et al.*, 2007; McIntyre *et al.*, 2009; Jo, 2014). On the other hand, indirect cost of illness, which is also known as 'productivity cost', typically includes productive time losses and lost income to the person who is ill, their household and even their employer while travelling to receiving care or waiting to be visited by a health professional (McIntyre *et al.*, 2006; McIntyre *et al.*, 2009; Jo, 2014).

Generally, indirect costs are more inconsistent to measure in comparison to direct costs (Russell, 2005; Jo, 2014). In terms of direct costs, one of the significant diversities between researches is the recall period applied in the household surveys which can be either one or two week. Additionally, the other difference between studies is that some analyses exclusively focus on direct expenses concerned the health care service while others also include non-health care direct costs like transportation fees (McIntyre *et al.*, 2006). In case of measuring indirect costs, some studies measure only the number of days off work due to ill-health, mostly include additional morbidity time while a few also estimate total years of productive life lost due to the early death to consider lifetime income foregone. Additional challenges arise through the various methods by which these estimates are rendered into monetary values, such as whether actual income lost or average wage rates are applied to productive time losses; in what way studies quantify cost of time lost for individuals who are not employed in the formal sector and; how to calculate the cost of time lost with regards to total unpaid household activities (Chima, Goodman and Mills, 2003; McIntyre *et al.*, 2006; Jo, 2014). Another entangling element is that the data may be displayed in various formats, for instance, costs as a percentage of monthly household income or as a percentage of annual household income (McIntyre *et al.*, 2006).

With reference to the vast body of research on financial barriers in access to TB services, this fact is clear that the cost burden of obtaining TB care and the following treatment is a broad subject affecting both genders, although in a slightly different way (Krishnan *et al.*, 2014). In a study conducted by Liefoghe *et al.* (1995) on social consequences of tuberculosis in Pakistan, the

results revealed that men were more likely to experience the direct and indirect economic consequence of illness, since their role as wage-earner would be restricted due to the disease, while married women were faced with a different financial burden. As the result of their marriage they belonged rather to the family-in-law than to their own family and they mostly lacked financial independence hence were reliant on their husband's financial support for their treatment while in-laws did not seem to feel the same responsibility for them as their own families did (Liefvooghe *et al.*, 1995).

Coping Strategies and Ability-to-pay

With respect to estimating the burden of disease, morbidity and mortality have been focused as two key indicators of a population's health-level, yet the negative impact of poor health on individual's well-being should be explored through a broader lens. To illustrate, unpredicted increase in health expenditure along with lowered functional capacity and lost earning or productivity, which are also known as 'health shocks', are among dominant risk factors for underdevelopment (World Health Organization, 2009). In a conceptual framework presented by Russel (2004), household has been considered as the preferable unit of analysis for measuring the costs of illness since final decisions about treatment are based on negotiations within the household, both caregivers and the patient bear ill-health costs, and ultimately costs fall on the household resources (Russell, 2004). Hence, at the microeconomic level, households who face health shocks usually employ various 'coping strategies' to alleviate the financial burden of illness, however there is a debate on the effectiveness of these coping mechanisms regarding longer-term asset and livelihood preservation; moreover, coping strategies are not free of cost and may impose harmful consequences on households in the future (Leive and Xu, 2008; WHO, 2009). As Russel (1996) argued, if households have to sacrifice some basic needs including food and education in order to pay the costs of treatment, the opportunity costs related to treatment might make it 'unaffordable' since other essential needs will be sacrificed (Russell, 1996). It is generally held that a total cost of illness exceeding 10% of household income is expected to be catastrophic and may put the household at the risk of impoverishment, yet considering different socio-economic statuses, it may not be true for affluent households that can promptly mobilize cash to pay the cost of treatment or even in the case of poorer households that a lower

proportion may be catastrophic (Russell, 2004; McIntyre *et al.*, 2006). This issue accentuates the necessity of considering the notion of ability-to-pay concerning the individual as well as household's income level by considering other demands on that household's resources (Cleary *et al.*, 2013).

The ability-to-pay as one of the key components of affordability dimension is affected by a number of factors. On the one hand, the eligibility of health seekers to benefit from different financial supporting mechanisms (such as public funding and health insurance) that protect them against the burden of health care costs at the time of service use may be influential. Moreover, the ability of households to cover the costs of health services at the point of delivery can also impress the individual's ability-to-pay in different ways, inclusive of the amount as well as schedule of income payments along with the individual's ability to make use of that income flow; the amount of cash savings and other assets owned by the household from which households can mobilize cash to cover the health care costs; the level of confidence in social networks in order to ask for financial assistance as gifts or loans and; the individual's capability to face indirect costs such as protecting income through sick leave benefits or replacing workforce to protect productivity in case of self-employment. In this vein, two individuals may have to meet the same costs of care which they both have the ability to incur; however, the consequences for the rest of their lives and that of their households may be dissimilar (Thiede *et al.*, 2007; McIntyre *et al.*, 2009).

With respect to financial barriers in access to TB services, a series of studies have indicated the inequitable allocation of household resources as one of the causes for gender-related inequity in access to TB health care services whereby men, as well as children, receive a larger proportion of total household resources. Mostly, men's well-being, as the primary breadwinner, is prioritised by households while women's health is undervalued due to inferior status within households and lack of financial autonomy (Krishnan *et al.*, 2014). In their investigation on access and adherence to TB treatment in Burkina Faso, Sanou *et al.* (2004) concluded that mobilising cash for covering the costs of daily accessing to the health care centres was difficult, mainly for women. Through an in depth-interview conducted in their study, one of the female TB patients claimed: "I don't

have any financial means, I have to bow to the decision of my brother-in-law” (Sanou et al., 2004, p.1481).

III-health and Poverty

As implicated in the discussion above, the economic costs of illness and consequently applied coping mechanisms differ among households with distinct socio-economic status. Looking across the vast body of existing literature, this is evident in the fact that the catastrophic health care expenses and that low-quality services hinder health service utilisation, particularly among the underprivileged; hence health services are mostly impotent in reaching the poor and generate less benefit for the impoverished than the better-off households. Moreover, health care services may create regressive cost burdens, as poor households spend a higher proportion of their income on health care than affluent households. In this context, a health care financing mechanism will be progressive as well as fair, if health care expenditure is moderately low in poorer households, yet this only holds true to those who can afford to access and use health services (Russell, 2004; McIntyre *et al.*, 2006). Whitehead et al. (2001) have defined a phenomenon in which “...rises in out-of-pocket costs for public and private health-care services are driving many families into poverty, and are increasing the poverty of those who are already poor”, as ‘medical poverty trap’ (Whitehead *et al.*, 2001). The medical poverty trap dictates a number of effects, such as untreated illness, lower access to care, enduring impoverishment, and irrational use of medicines (Whitehead *et al.*, 2001). In the case of untreated morbidity, as the most severe consequence of the medical poverty trap, those who cannot afford the health care services and hence ignore their illness, are at risk of further suffering and worsening health. In the same context, irrational prescribing of drugs by whom either has financial incentives to overprescribe or are not qualified is another significant contribution to the inequities of the medical poverty trap. As a corollary to this phenomenon which is most common in developing countries, poor people may receive ineffective or even hazardous treatment, such as inappropriate TB treatment which in fact increase the risk of drug resistance (Whitehead *et al.*, 2001).

Availability

The availability dimension, which investigates the importance of physical access (spatial access) to health care services, is involved in whether or not the relevant health care professionals and services are provided at the appropriate time and in the proper place that they are needed to meet the population's health demands (Thiede *et al.*, 2007; McIntyre *et al.*, 2009). In order to describe the availability, the fit among individual factors and health system elements should be explored. Individual factors influencing availability dimension are as follows: the health needs of individuals as well as the severity of their condition; the patients' locations and their means of transport and; the time that individuals need services to be provided. The health system elements are inclusive of the location of health facility; level of supply of staff or drugs; the organisation and qualification of personnel as well as their willingness to serve the patients; the appointment system; the facility hours as well as working hours of health professionals and; the form of services that they provide (inclusive of quantity, quality, whether they provide in-patient care or out-patient care, and whether they provide comprehensive care or patients will be referred to different facilities in multiple locations) (Thiede *et al.*, 2007; McIntyre *et al.*, 2009).

In 2009, Goudge et al. (2009) conducted a longitudinal case study to explore barriers to accessing chronic disease treatments in South African context (Goudge *et al.*, 2009). Their findings on availability dimension illustrate that due to health system deficiency as well as unavailability of required services for chronic care, provided services did not result in regular treatment and control of symptoms. A number of respondents mentioned interrupted drug supply by clinics as one of the major barriers that led them to self-treatment rather than wasting resources on transport for an ineffective trip to their local clinics that frequently ran out of drugs. Moreover, as a result of poor clinical services and weaknesses in diagnosing and treatment prescription at clinics, some participants were asked to return to the clinic in two weeks to collect the TB-test results that cost them transportation fee and delayed their treatment. Other barriers highlighted by participants were weaknesses in the referral system and insufficient ambulance services. In one case, different diagnoses by the clinic and the hospital and their failure of communication, left the patient confused about whether she should go to the clinic or hospital for further treatment. The authors conclude that in order to enhance the public sector it is crucial to

improving public clinic's capacity, referral systems, ambulance services, and drug supply chains besides addressing the financial barriers faced by the socially deprived patients (Goudge *et al.*, 2009).

In a similar vein, Burger and Christian (2018) have combined the data of South Africa's 2009 and 2010 General Household Surveys with quantitative methods to investigate the barriers to accessing health care services in South Africa during the post-apartheid era (Burger and Christian, 2018). According to their findings, high levels of acceptability but lower levels of affordability as well as availability of health care services, particularly for vulnerable groups such as the poor, black South Africans, and the rural population were existing. The most substantial constraints in access were in the availability dimension (including distances, transport costs, and improper opening times) where 27% of individuals were reported as facing barriers. A high inequality in availability among the poor (59%) and the non-poor (83%) was observed. Moreover, urban residents (85%) reported higher unavailability in comparison to rural residents (60%) (Burger and Christian, 2018).

In 2008, through a gender-disaggregated study, Mfinanga *et al.* (2008) have explored the significance and elements of the postponement in the management of smear-positive TB in Dar es Salaam, Tanzania (Mfinanga *et al.*, 2008). A cross-sectional hospital-based survey was distributed to three districts of Dar es Salaam that has the most substantial burden of TB patients in Tanzania. In their study referral delay was applicable when the time between the first visit to a doctor and the time the patient is seen at a health facility with DOTS services exceeded 48 hours. Also, diagnosis delayed was defined as a situation in which the time between the first consultation at a health facility providing DOTS services and diagnosis of TB exceeded 72 hours (Mfinanga *et al.*, 2008). Their findings illustrated that 52.9% of the patients experienced postponement in diagnosis. Delayed TB diagnosis was more common in females (62.1%) than in males (47.0%). Moreover, facility delay which was reported by more than four-fifths of the participants was significantly higher in females (88.8%) than in males (79.8%). These results revealed that female participants in the study experienced greater availability barriers than the male participant (Mfinanga *et al.*, 2008).

Considering all the preceding discussions on the availability dimension of access, the impact of availability dimension on the patient's empowerment to make use of health services can be evaluated only if interactions among different factors influencing this dimension are recognised. For instance, as mentioned by McIntyre et al. (2009), "Trade-offs may exist between geographic distance to facilities and the quality of care provided" (McIntyre *et al.*, 2009, p.185).

Conclusion

As highlighted in the presented literature review, the South African government is facing the challenge of diminishing imbalances of health services of the pre-apartheid era and establishing a society based on social justice and basic human rights. In South Africa, just like most of the other countries in the world, the rate of disease and mortality are indeed higher among the marginalised population. Inequitable barriers exist in accessing health care services are among the biggest and most avoidable causes of health disparities in every context. A number of previous studies in various contexts have attempted to investigate if gender intersects with access barriers to TB treatment. Evidence suggests that several countries reported gender as an important factor in accessing TB services; however, there was no specific study on this topic in the South African context. The present study aimed to explore the gender-related disparities in accessing TB services in South Africa, through a gender-disaggregated analysis by applying comprehensive conceptual framework of mapping access to health care services which is developed by Thiede et al. (2007) and McIntyre et al. (2009). Based on the above literature, the mentioned conceptual framework describes access as the empowerment of an individual, specifically within the context of LMICs, to use and benefit from health care. This framework also grants the empirical examination of access by classifying factors into three dimensions: affordability, availability, and acceptability through focusing on both supply- and demand-side factors.

Bibliography

- Aday, L.A. and Andersen, R., 1974. A framework for the study of access to medical care. *Health services research*, 9(3), p.208.
- Aday, L.A. and Andersen, R.M., 1981. Equity of access to medical care: a conceptual and empirical overview. *Medical care*, pp.4-27.
- Aday, L.A., Andersen, R. and Fleming, G.V., 1980. Health care in the US: Equitable for whom?.
- Andersen, R. and Newman, J.F., 1973. Societal and individual determinants of medical care utilization in the United States. *The Milbank Memorial Fund Quarterly. Health and Society*, pp.95-124.
- Andersen, R.M., 1995. Revisiting the behavioral model and access to medical care: does it matter?. *Journal of health and social behavior*, pp.1-10.
- Ataguba, J.E., Akazili, J. and McIntyre, D., 2011. Socioeconomic-related health inequality in South Africa: evidence from General Household Surveys. *International journal for equity in health*, 10(1), p.48.
- Ataguba, J., 2010. Health care financing in South Africa: moving towards universal coverage. *Continuing Medical Education*, 28(2), pp.74–78.
- Batterham, R.W., Hawkins, M., Collins, P.A., Buchbinder, R. and Osborne, R.H., 2016. Health literacy: applying current concepts to improve health services and reduce health inequalities. *Public health*, 132, pp.3-12.
- Benatar, S., 2013. The challenges of health disparities in South Africa. *SAMJ: South African Medical Journal*, 103(3), pp.154-155.
- Berkman, N.D., Sheridan, S.L., Donahue, K.E., Halpern, D.J. and Crotty, K., 2011. Low health literacy and health outcomes: an updated systematic review. *Annals of internal medicine*, 155(2), pp.97-107.
- Birch, S. and Anderson, R., 2005. Financing and delivering oral health care: what can we learn from other countries?. *Journal of the Canadian Dental Association*, 71(4).
- Blaxter, M., 1983. Health services as a defence against the consequences of poverty in industrialised societies. *Social Science & Medicine*, 17(16), pp.1139-1148.
- Braveman, P. and Gruskin, S., 2003. Defining equity in health. *Journal of Epidemiology & Community Health*, 57(4), pp.254-258.
- Braveman, P. and Tarimo, E., 2002. Social inequalities in health within countries: not only an issue for affluent nations. *Social science & medicine*, 54(11), pp.1621-1635.
- Brink, A.S. and Koch, S.F., 2015. Did primary healthcare user fee abolition matter? Reconsidering South Africa's experience. *Development Southern Africa*, 32(2), pp.170-192.

- Burger, R., Bredenkamp, C., Grobler, C. and van der Berg, S., 2012. Have public health spending and access in South Africa become more equitable since the end of apartheid?. *Development Southern Africa*, 29(5), pp.681-703.
- Burger, R. and Christian, C., 2018. Access to health care in post-apartheid South Africa: Availability, affordability, acceptability. *Health Economics, Policy and Law*, pp.1-13.
- Chetty, K.S., 2007. Equity promoting health care policies in South Africa. In *Equity promoting health care policies in South Africa*. OMS.
- Chima, R.I., Goodman, C.A. and Mills, A., 2003. The economic impact of malaria in Africa: a critical review of the evidence. *Health policy*, 63(1), pp.17-36.
- Chopra, M., Lawn, J.E., Sanders, D., Barron, P., Karim, S.S.A., Bradshaw, D., Jewkes, R., Karim, Q.A., Flisher, A.J., Mayosi, B.M. and Tollman, S.M., 2009. Achieving the health Millennium Development Goals for South Africa: challenges and priorities. *The Lancet*, 374(9694), pp.1023-1031.
- Cleary, S., Birch, S., Chimbindi, N., Silal, S. and McIntyre, D., 2013. Investigating the affordability of key health services in South Africa. *Social science & medicine*, 80, pp.37-46.
- Coovadia, H., Jewkes, R., Barron, P., Sanders, D. and McIntyre, D., 2009. The health and health system of South Africa: historical roots of current public health challenges. *The Lancet*, 374(9692), pp.817-834.
- Daftary, A., Frick, M., Venkatesan, N. and Pai, M., 2017. Fighting TB stigma: we need to apply lessons learnt from HIV activism. *BMJ Global Health*, 2(4), p. e000515.
- Daniels, N., 1982. Equity of access to health care: some conceptual and ethical issues. *The Milbank Memorial Fund Quarterly. Health and Society*, pp.51-81.
- Donabedian, A., 1972. Models for organizing the delivery of personal health services and criteria for evaluating them. *The Milbank Memorial Fund Quarterly*, 50(4), pp.103-154.
- Easton, P., Entwistle, V.A. and Williams, B., 2013. How the stigma of low literacy can impair patient-professional spoken interactions and affect health: insights from a qualitative investigation. *BMC health services research*, 13(1), p.319.
- Fusheini, A., Eyles, J. and Goudge, J., 2018. The place of private care governance in the South African health care system. *The International journal of health planning and management*, 33(4), pp. e999-e1013.
- Gilson, L., 2007. with inputs and contributions from the members of the Health Systems Knowledge Network. *Final report of the Health Systems Knowledge Network to the Commission on Social Determinants of Health*.
- Gilson, L., McIntyre, D. and Mooney, G., 2007. Acceptability, trust and equity. *The economics of health equity*, pp.124-147.
- Goddard, M. and Smith, P., 2001. Equity of access to health care services: Theory and evidence from the UK. *Social science & medicine*, 53(9), pp.1149-1162.

- Goudge, J., Gilson, L., Russell, S., Gumedde, T. and Mills, A., 2009. Affordability, availability and acceptability barriers to health care for the chronically ill: longitudinal case studies from South Africa. *BMC health services research*, 9(1), p.75.
- Goudge, J., Gilson, L., Russell, S., Gumedde, T. and Mills, A., 2009. The household costs of health care in rural South Africa with free public primary care and hospital exemptions for the poor. *Tropical medicine & international health*, 14(4), pp.458-467.
- Gray, A. and Vawda, Y., 2017. Health policy and legislation. *South African Health Review*, 2017(1), pp.13-24.
- Gulliford, M., Figueroa-Munoz, J., Morgan, M., Hughes, D., Gibson, B., Beech, R. and Hudson, M., 2002. What does 'access to health care' mean?. *Journal of health services research & policy*, 7(3), pp.186-188.
- Gulliford, M., 2009. Modernizing concepts of access and equity. *Health Economics, Policy and Law*, 4(2), pp.223-230.
- Hall, J. J. and Taylor, R., 2003. Health for all beyond 2000: The demise of the Alma-Ata Declaration and primary health care in developing countries. *Medical Journal of Australia*, 178(1), pp.17–20.
- Harrison, D., 2009. An overview of health and health care in South Africa 1994–2010: Priorities, progress and prospects for new gains. *Washington, DC: Henry J Kaiser Family Foundation*.
- Hassim, A., Heywood, M., Berger, J., 2007. The Private Health Care Sector, in: *Health and Democracy: A Guide to Human Rights, Health Law and Policy in Post-Apartheid South Africa*. pp. 162–199.
- Health Policy Project, 2016. Health Financing Profile - South Africa. Health Policy Project 2.
- Health Systems Trust, 2018. District Health Barometer 2016/2017. Health System Trust.
- Honda, A., Ryan, M., van Niekerk, R. and McIntyre, D., 2014. Improving the public health sector in South Africa: eliciting public preferences using a discrete choice experiment. *Health policy and planning*, 30(5), pp.600-611.
- Ibrahim, L.M., Hadjia, I.S., Nguku, P., Waziri, N.E., Akhimien, M.O., Patrobas, P. and Nsubuga, P., 2014. Health care workers' knowledge and attitude towards TB patients under Direct Observation of Treatment in Plateau state Nigeria, 2011. *The Pan African medical journal*, 18(Suppl 1).
- Jo, C., 2014. Cost-of-illness studies: concepts, scopes, and methods. *Clinical and molecular hepatology*, 20(4), p.327.
- Jobson, M., 2015. Structure of the health system in South Africa. *Johannesburg: Khulumani support group*. Available at: <https://www.khulumani.net/active-citizens/item/1164-the-health-system-in-south-africa-actions-to-secure-the-right-to-health-in-south-africa.html> (Accessed: 16 November 2018).
- Koch, S.F., 2017. User fee abolition and the demand for public health care. *South African Journal of Economics*, 85(2), pp.242-258.

- Krasnik, A., 1996. The concept of equity in health services research. *Scandinavian Journal of Social Medicine*, 24(1), pp.2-7.
- Krishnan, L., Akande, T., Shankar, A.V., McIntire, K.N., Gounder, C.R., Gupta, A. and Yang, W.T., 2014. Gender-related barriers and delays in accessing tuberculosis diagnostic and treatment services: a systematic review of qualitative studies. *Tuberculosis research and treatment*, 2014.
- Le Grand, J., 2002. Equity and choice: an essay in economics and applied philosophy. Routledge.
- Leive, A. and Xu, K., 2008. Coping with out-of-pocket health payments: empirical evidence from 15 African countries. *Bulletin of the World Health Organization*, 86, pp.849-856C.
- Liefooghe, R., Michiels, N., Habib, S., Moran, M.B. and De Muynck, A., 1995. Perception and social consequences of tuberculosis: a focus group study of tuberculosis patients in Sialkot, Pakistan. *Social Science & Medicine*, 41(12), pp.1685-1692.
- Macintyre, S., McKay, L. and Ellaway, A., 2006. Lay concepts of the relative importance of different influences on health; are there major socio-demographic variations?. *Health Education Research*, 21(5), pp.731-739.
- Marten, R., McIntyre, D., Travassos, C., Shishkin, S., Longde, W., Reddy, S. and Vega, J., 2014. An assessment of progress towards universal health coverage in Brazil, Russia, India, China, and South Africa (BRICS). *The Lancet*, 384(9960), pp.2164-2171.
- McIntyre, D., Thiede, M., Dahlgren, G. and Whitehead, M., 2006. What are the economic consequences for households of illness and of paying for health care in low-and middle-income country contexts?. *Social science & medicine*, 62(4), pp.858-865.
- McIntyre, D., 2007. Learning from experience: health care financing in low-and middle-income countries. Geneva: Global forum for health research.
- McIntyre, D.I., Thiede, M. and Birch, S., 2009. Access as a policy-relevant concept in low-and middle-income countries. *Health Economics, Policy and Law*, 4(2), pp.179-193.
- Mfinanga, S.G., Mutayoba, B.K., Kahwa, A., Kimaro, G., Mtandu, R., Ngadaya, E., Egwaga, S. and Kitua, A.Y., 2008. The magnitude and factors associated with delays in management of smear positive tuberculosis in Dar es Salaam, Tanzania. *BMC health services research*, 8(1), p.158.
- Mooney, G., 2009. Is it not time for health economists to rethink equity and access?. *Health economics, policy and law*, 4(2), pp.209-221.
- Mooney, G.H., 1983. Equity in health care: confronting the confusion. *Effective health care*, 1(4), pp.179-185.
- Munro, S.A., Lewin, S.A., Smith, H.J., Engel, M.E., Fretheim, A. and Volmink, J., 2007. Patient adherence to tuberculosis treatment: a systematic review of qualitative research. *PLoS medicine*, 4(7), p. e238.

- Noé, A., Ribeiro, R.M., Anselmo, R., Maixenchs, M., Sitole, L., Munguambe, K., Blanco, S., Souef, P. and García-Basteiro, A.L., 2017. Knowledge, attitudes and practices regarding tuberculosis care among health workers in Southern Mozambique. *BMC pulmonary medicine*, 17(1), p.2.
- Nutbeam, D., 2008. The evolving concept of health literacy. *Social science & medicine*, 67(12), pp.2072-2078.
- Obuaku-Igwe, C.C., 2015. Health inequality in South Africa: a systematic review. *African Sociological Review/Revue Africaine de Sociologie*, 19(2), pp.96-131.
- Oliver, A. and Mossialos, E., 2004. Equity of access to health care: outlining the foundations for action. *Journal of Epidemiology & Community Health*, 58(8), pp.655-658.
- Ong, K.S., Kelaher, M., Anderson, I. and Carter, R., 2009. A cost-based equity weight for use in the economic evaluation of primary health care interventions: case study of the Australian Indigenous population. *International journal for equity in health*, 8(1), p.34.
- Onifade, D.A., Bayer, A.M., Montoya, R., Haro, M., Alva, J., Franco, J., Sosa, R., Valiente, B., Valera, E., Ford, C.M. and Acosta, C.D., 2010. Gender-related factors influencing tuberculosis control in shantytowns: a qualitative study. *BMC Public Health*, 10(1), p.381.
- Ostlin, P., Braveman, P., Dachs, N., Team, W.E. and WHO Task Force on Research Priorities for Equity in Health, 2005. Priorities for research to take forward the health equity policy agenda. *Bulletin of the World Health Organization*, 83(12), p.948.
- Passchier, R.V., 2017. Exploring the barriers to implementing National Health Insurance in South Africa: The people's perspective. *South African Medical Journal*, 107(10).
- Penchansky, R. and Thomas, J.W., 1981. The concept of access: definition and relationship to consumer satisfaction. *Medical care*, pp.127-140.
- Public Health England, UCL Institute of Health Equity, 2015. Improving health literacy to reduce health inequalities. Public Health England.
- Ricketts, T.C. and Goldsmith, L.J., 2005. Access in health services research: the battle of the frameworks. *Nursing outlook*, 53(6), pp.274-280.
- Rosenstock, I.M., 1996. Why people use health services. *The Milbank Memorial Fund Quarterly* 44, 94–127.
- Russell, S., 1996. Review article Ability to pay for health care: concepts and evidence. *Programme, Financing Unit, Health Policy*, 11(3), pp.219–237.
- Russell, S., 2004. The economic burden of illness for households in developing countries: a review of studies focusing on malaria, tuberculosis, and human immunodeficiency virus/acquired immunodeficiency syndrome. *The American journal of tropical medicine and hygiene*, 71(2_suppl), pp.147-155.

- Russell, S., 2005. Illuminating cases: understanding the economic burden of illness through case study household research. *Health policy and planning*, 20(5), pp.277-289.
- Sanou, A., Dembele, M., Theobald, S. and Macq, J., 2004. Access and adhering to tuberculosis treatment: barriers faced by patients and communities in Burkina Faso. *The international journal of tuberculosis and lung disease*, 8(12), pp.1479-1483.
- South Africa National Department of Health. (2015). National Health Insurance for South Africa: towards universal health coverage. White Paper. Available at: <http://www.doh.gov.za/list.php?type=National Health Insurance> (Accessed: 26 September 2018).
- Statistics South Africa, 2015. MDG Country Report.
- Statistics South Africa, 2017. Public healthcare: How much per person?. Available at: <http://www.statssa.gov.za/?p=10548> (Accessed: 13 August 2018).
- Thiede, M. and Akweongo, P., 2007. Exploring the dimensions of access. In 'The economics of health equity'. (Eds D McIntyre, G Mooney) pp. 103–123.
- UNICEF, 2017. Health Budget South Africa 2017/2018.
- Van Rensburg, H.C., 2014. South Africa's protracted struggle for equal distribution and equitable access—still not there. *Human resources for health*, 12(1), p.26.
- Veitch, C., 2017. The Healthcare Sector - South Africa, WHO OWNS WHOM. Available at: <https://www.whoownswhom.co.za/store/info/4535?segment=Healthcare> (Accessed: 13 August 2018).
- Wadee, H., Gilson, L., Thiede, M., Okorafor, O. and McIntyre, D., 2003. Health Care Inequity in South Africa and the Public / Private Mix, United Nations Research Institute for Social Development.
- Whitehead, M., 1991. The concepts and principles of equity and health. *Health promotion international*, 6(3), pp.217-228.
- Whitehead, M., Dahlgren, G. and Evans, T., 2001. Equity and health sector reforms: can low-income countries escape the medical poverty trap?. *The Lancet*, 358(9284), pp.833-836.
- World Health Organization, 1986. Social justice and equity in health: Report on a WHO meeting (ICP/HSR 804/m02). Copenhagen.
- World Health Organization, 2009. WHO guide to identifying the economic consequences of disease and injury.
- Yang, W.T., Gounder, C.R., Akande, T., De Neve, J.W., McIntire, K.N., Chandrasekhar, A., de Lima Pereira, A., Gummadi, N., Samanta, S. and Gupta, A., 2014. Barriers and delays in tuberculosis diagnosis and treatment services: does gender matter?. *Tuberculosis research and treatment*, 2014.
- Zarcadoolas, C., Pleasant, A. and Greer, D.S., 2005. Understanding health literacy: an expanded model. *Health promotion international*, 20(2), pp.195-203.

PART C: JOURNAL MANUSCRIPT

Health Policy

journal homepage: www.elsevier.com/locate/healthpol

Gender Inequalities in Access to Tuberculosis Services in South Africa

Mina Haji^{a1,*}, Susan Cleary^a

^a Health Economics Unit, School of Public Health and Family Medicine, University of Cape Town, Anzio Road, 7925, Observatory Cape Town, South Africa

ARTICLE INFO

ABSTRACT

Key Words:

Health care access
Tuberculosis (TB)
Gender inequality
Adherence
Availability
Affordability
Acceptability

Objective: As one of the major public health challenges in South Africa, it is crucial that increased attention be paid to controlling the TB epidemic. While gender, as a social determinant of health, has been reported to impact the access and adherence to TB services in other settings, gender-related barriers to TB access have been an under-researched area in South Africa. This paper explores gender-based disparities in access and adherence to TB services in South Africa, from the perspective of TB patients attending primary health care facilities.

Methods: Using a comprehensive framework of access, interviews were conducted with 1229 TB patients from four health sub-districts in South Africa, to assess gender-related inequalities across the access dimensions of availability, affordability and acceptability of TB services. Descriptive statistics were computed, and comparisons of access barriers and adherence between men and women were explored using multivariate linear and logistic regressions.

Results: There was no significant association between levels of adherence and gender (all p-values > 0.05). Among availability-related variables, men spent significantly less time at the clinic to fetch TB medication (coefficient, -7.06; 95% CI, [-13.5, -0.7]); however among affordability-related variables, men were significantly less likely to receive a disability grant (AOR, 0.48; 95% CI, [0.36, 0.63]), and among acceptability-related variables men were significantly less likely to judge the length of queues to be too long or the cleanliness of the facility to be sub-standard (AOR, 0.69; 95% CI, [0.52, 0.91], and AOR, 0.67; 95% CI, [0.46, 0.97], respectively).

Conclusions: Our findings indicate that there is no association between the level of adherence to TB treatment and gender. Moreover, there was no evidence of systematic gender-based inequalities in access to TB services. However, the findings reveal concerns about the condition and cleanliness of health facilities that may impact the patients' adherence and be a barrier, specifically, in women's use of TB services.

Introduction

Tuberculosis (TB), as a major public health challenge, encompasses a high proportion of the global disease burden and is associated with significant gender-related inequalities, described by binary male/female

sex categories [1]. TB is the leading natural cause of mortality in South Africa, and the country has the sixth-highest TB burden globally [2,3]. In 2016, there were an estimated 438 000 new diagnoses, at a rate of

¹ Corresponding author. Tel.: +27.71.746.2372; E-mail address: HJXMIN001@uct.ac.za

781 cases per 100 000 population, from which 182 000 cases were among women and 256 000 were among men. South Africa also has the highest burden of HIV co-infected cases in the world, estimated at 258 000 [4]. The emergence of multidrug-resistant tuberculosis (MDR-TB) has been the main contributor to the high burden of TB in the country wherein treatment outcomes are poor, with a success rate of approximately 50% [5]. Globally, the majority of reported cases of extremely drug-resistant TB (XDR-TB) are from South Africa. XDR-TB is the most drug-resistant form of TB which is expensive and difficult to treat as well as associated with high mortality rates and treatment failures [6]. Moreover, since HIV-infected individuals are at higher risk of developing active TB, the intersection of TB and HIV has caused a double burden of disease in the country [7,8].

In 1996, the outbreak of MDR-TB in South Africa was declared a national emergency; consequently, the South African government developed the National Tuberculosis Control Programme (NTCP) on the basis of the Directly Observed Treatment, Short-Course (DOTS) strategy which had been introduced by the World Health Organization (WHO) to improve patient adherence [9-11]. In spite of considerable achievements, the case detection and treatment success rates remained less than 60% and 76%, respectively, falling short of the WHO targets of 70% case detection and 85% treatment success rates [12]. In 2011, the government revised the guidelines supporting decentralised DR-TB service provision and also implemented new diagnostic tests such as the Xpert test. These responses increased the number of diagnosed DR-TB cases, and South Africa has made considerable progress in enhancing TB control since 2012 [9,13]. Indeed, TB-related mortality decreased by 21%, from 41 904 deaths in 2013 to 33 063 in 2015; however, the current rate of decrease is too slow to meet the 2030 Sustainable Development Goals (SDGs) as well as 2035 End TB Strategy targets [4]. Inferring from WHO estimates, tuberculosis incidence rates for South Africa would need to decrease to less than 167 cases per 100 000 population, and mortality also would need to reduce to 9800 in order to meet these targets [13].

Over the past two decades, the focus of the NTCP has been on improving the rates of treatment success while failing to address upstream losses experienced by patients who did not gain access to health services and whose infections were not diagnosed and treated [13]. Therefore, to reach the SDGs and end the TB epidemic in the country, a comprehensive understanding of access barriers to TB services is necessary, including

an understanding of how these barriers intersect with gender [1,4].

Broadly, improving access to health care is a crucial goal of universal health systems; yet, there still exists controversy over the precise meaning of the term access to health care [14,15]. In the earlier literature, access to health care was primarily regarded in terms of two key factors: distance travelled to use health care services as well as money fees at the point of service utilisation. Others have proxied access as service utilisation, which is easier to measure and evaluate. Recently, access has been defined as the empowerment of a health seeker to use health care, a multidimensional concept based on the degree of fit between individuals, households, communities, and health care systems. According to this conceptualisation, the three dimensions of access are affordability (or financial access), availability (or spatial access), and acceptability (or sociocultural access) [14,16]. The three dimensions of access are argued to be a starting point for empirical investigation of access to health services and also for health policy development, that can address detected barriers [16].

The present study aims to unpack the gender-related barriers and inequalities in access to TB treatment services in South Africa. Findings from this study may provide evidence to assist in evaluating the success of the current TB policy and may further assist in designing policies to improve health equity between men and women as well as ensuring that the TB-related goals set by the WHO will be achieved.

Materials and methods

Study Design & Conceptual Framework of Access

This study relies on data drawn from the Researching Equity in Access to Health Care (REACH) project, a study of health system access in South Africa conducted between May 2007 and April 2012. Full details regarding data collection can be obtained from published sources [17]. In summary, an interviewer-administered, exit interview-style questionnaire was developed to gather socioeconomic and demographic data; data regarding the individual's housing characteristics; an estimate of household income, monthly household expenditure, and household assets; as well as data concerning key barriers to TB treatment accessibility, from the patients' perspective.

This study is framed within a conceptual framework of access where access is defined in terms of the degree of fit between the needs of individuals and health system responses within the dimensions of affordability, availability, and acceptability. A fundamental part of this framework is the

understanding that while each dimension of access is focused on its issues, they are interconnected and impact the interaction between the health system and its users. More precisely, affordability is principally concerned with the degree of fit between costs of service use and household ability to pay; availability is affected by the fit between population needs and the type, place and time of services provided; and acceptability is focused on the degree of fit between provider and patient expectations of and attitudes towards each other [14,16]. In accordance with Braveman & Gruskin [18], inequalities in access emerge if barriers are systematically different for individuals with distinct levels of social advantage, including with respect to their gender. As an example, if reported TB-related stigma is higher among female participants as compared with males while females may delay or reject seeking treatment as the consequence of stigma burden, then this is evidence of gender inequalities in access to TB services.

In this study, each dimension of access is captured by several variables. Availability variables incorporate the travel time to reach the TB treatment facility, the mode of travel and the waiting time at the facility for health professional visit during the previous clinic attendance. Affordability variables included whether or not the participant was receiving a government chronic care grant, and the cost incurred during the current TB facility visit which was converted to monthly expenditure estimates using information on the reported frequencies of TB clinic visits. Participants were also asked whether they were required to borrow money in order to meet the costs of treatment. Moreover, respondents were asked about other health care expenditure they had incurred during the previous month, such as expenditure on other providers (e.g. general practitioners in the private sector and traditional healers) and spending on self-care (e.g. costs of special foods or costs of traditional medicines). By comparing these costs with the patient's reported overall monthly household expenditure, catastrophic health care expenditure was computed as expenditure on health care exceeding 10% of total household expenditure. In respect of acceptability, participants were asked to report their perceptions of staff attitudes (whether they felt respected by staff and if the staff were too busy to answer their questions), the length of queues, facility cleanliness (inclusive of waiting areas and toilets), and community stigma (whether they felt that people in the community judge them negatively for attending the TB facility for their treatment).

It is widely accepted that poor adherence to anti-tuberculosis medications is one of the main barriers to

global TB control [19]. Overall, there has been a range of approaches whereby adherence has been defined in different research and policy contexts. Adherence to medication can be described as the extent to which the patient's history of remedial drug-taking matches the prescribed treatment regimen [19,20]. Assessment of adherence to treatment may also be outcome-oriented (using the final results of treatment as an index to measure success) or process-oriented (using the intermediate variables to measure adherence) [20]. In this analysis, the level of adherence is assessed through a process-oriented approach. Accordingly, the intermediate variables of having ever missed a TB clinic visit or missed a dose of TB medication is used as a proxy for non-adherence. Hence, in order to identify adherence status, patients were asked whether they had missed any clinic visits and/or any treatment doses.

Study Setting & Sampling

Four sub-districts were purposively selected and sampled by the REACH research team [17]. These sub-districts belonged to four provinces representing two rural (Bushbuckridge in Mpumalanga Province and Hlabisa in Northern KwaZulu Natal) as well as two urban settings (Mitchells Plain in the Cape Metropole, Western Cape Province; and Soweto in the City of Johannesburg, Gauteng Province). The logic of this selection was to reflect different geographic locations (rural-urban mix) as well as differences in governance contexts. In finalising the selection of sub-districts, key officials in the national and provincial health departments were consulted.

A representative sample of 1229 TB patients was interviewed within 30 TB facilities across the four settings (approximately 300 participants per setting). In each sub-district, two-stage sampling was used: first, selecting a representative sample of primary health care facilities, then within chosen facilities, a representative sample of TB users [17]. Since most public health facilities in the country provide TB services, a minimum of five facilities were selected in each sub-district through the probability proportional to size (PPS) method, based upon the total number of TB users in each facility. Within selected facilities, a random sample of patients was interviewed until the proposed facility sample size was met. Respondents were eligible if they were over the age of 18, considered to be adequately well to be interviewed, and had been on TB treatment for at least eight weeks. After obtaining written informed consent from participants in the study, the interview was conducted by trained fieldworkers in the language of each subject's choice. Ethical approval for the initial study,

of which this study is a sub-component, was obtained from ethics committees at the Universities of KwaZulu-Natal, Cape Town and Witwatersrand. Further permission to conduct the research was acquired from both provincial as well as local health authorities in South Africa.

Data Analysis

Data were analysed using Stata/IC 15.0. Summary statistics and cross-tabulations were used to describe socioeconomic, demographic as well as service-related characteristics of male and female participants. Using the same method, the factors affecting access (inclusive of affordability, availability, and acceptability variables) were assessed relative to the gender of participants. Socioeconomic variables included employment, education and a composite asset index that allocated individuals to socioeconomic classes according to their household characteristics (such as type of house, toilet facility, walls, water supply, electricity for cooking, roof, etc.), and assets (including fridge, stove, DVD player, television, cell-phone, bicycle, etc.) [21,22]. The index was constructed using the multiple correspondence analysis (MCA). While the construction of asset indices is commonly achieved using principal components analysis (PCA), such a technique is more appropriate for use with continuous, normally distributed data as opposed to the predominantly categorical data often used in asset indices development [21-23].

Fisher's exact test or Mantel-Haenszel chi-square was

used to compare the association between categorical variables. Furthermore, the association between continuous variables was assessed applying the Mann-Whitney *U* test (for medians) and Student's *t*-test (for means). A *p*-value less than 0.05 was accepted as statistically significant. Multivariate logistic and linear regressions were run in order to test the differences in access by gender as well as to assess the association between adherence level and gender, after controlling for age, socioeconomic status (asset index), level of education, employment status, setting, as well as duration on TB treatment. In this way, we can explicitly focus on gender-related access barriers and test inequality in these barriers by holding the other variables constant.

Results

Study sample characteristics

Table 1 documents the socioeconomic, demographic, and service-related characteristics of the study participants, stratified by gender. The study sample had a balanced gender distribution (female 52.7%) and, as per the design of the study, approximately half were living in an urban setting (51.3%). The mean age of the participants was about 40 years and 35 years for males and females, respectively. As shown in Table 1, approximately one-quarter of participants were married or living with a partner (25.8%), one-sixth were employed (16.5%), about two-thirds were receiving a disability grant (73.72), and the majority of participants self-reported as African / black (94.8%). Compared with men, women had more years of schooling ($p < 0.001$) and a greater chance of getting disability benefits ($p < 0.001$). In contrast, a higher proportion of male participants reported that they were

Table 1. Characteristics of TB users, in total and by sex.

| <i>Variables:</i> | <i>All respondents (n=1229)</i> | <i>Males (n=586;47.7%)</i> | <i>Females (n=643;52.3%)</i> | <i>p-value</i> |
|--|-------------------------------------|--------------------------------|----------------------------------|----------------|
| Mean (median) age in years | 37.35(36) | 40.07(38) | 34.87(33) | <0.001 |
| Married / living with partner (%) (vs single) | 25.81 | 36.69 | 15.89 | <0.001 |
| Respondent employed (%) | 16.53 | 20.31 | 13.08 | 0.001 |
| Mean (median) years of schooling | 7.89(9) | 7.36(8) | 8.36(10) | <0.001 |
| Urban setting (%) | 51.34 | 52.73 | 50.08 | 0.353 |
| Receiving a disability grant (%) | 73.72 | 66.72 | 80.09 | <0.001 |
| Asset index (% in poorest half) | 50.04 | 48.98 | 51.01 | 0.476 |
| African/black (%) (vs coloured and white) | 94.79 | 93.86 | 95.65 | 0.159 |
| New patients (%) (vs re-treatment) | 96.91 | 96.08 | 97.67 | 0.107 |
| Clinic DOT (%) (vs others) | 33.44 | 34.64 | 32.35 | 0.699 |
| Adherents (%) (vs non-adherents) | 82.02 | 81.57 | 82.43 | 0.696 |
| Never missed TB doses (%) | 85.44 | 84.81 | 86.00 | 0.554 |
| Never missed TB visits (%) | 86.57 | 86.18 | 86.94 | 0.697 |

p-values computed using Wilcoxon-Mann-Whitney test for quantitative data; chi-squared goodness of fit test for binary data.

employed ($p=0.001$), as well as married or living with a partner ($p<0.001$). There was no significant difference in the asset index, with men and women having similar asset-based wealth.

Since the study sample is based on patients who attended primary health care centres, those with higher severity, who normally would be treated at secondary health care facilities, are less likely to have been included. Overall, the majority of participants were new TB patients (96.9%). Concerning the type of program, nearly one-third of respondents (33.4%) reported daily observed therapy at clinics (clinic DOT). Regarding adherence, 82% reported that they had never missed TB treatment (neither a single dose nor a visit), 84.8% of males and 86% of female patients reported they had never missed TB doses, similarly the proportions of the patients who never missed a TB visit were almost the same between (86.2% of males and 86.9% of females). Besides, the parameters inclusive of the type of treatment and type of patient (new or retreatment) were found not to be associated with gender.

Gender differences in access to TB treatment

Table 2 presents gender-level results of bivariate, unadjusted analysis and the multivariate analysis on each of the access variables involved in this study. The results of multivariate regressions are presented as coefficients or adjusted odds ratio (AOR). Considering female gender as the referent, these results summarise differences between male and female respondents across each dependent access variable, after controlling for age, sex, SES (asset index), level of education, employment status, and setting.

In terms of availability, at the bivariate level, female participants on average spent more time travelling to the facilities than males whereby the average travel time for females was 36.4 minutes as compared to 34.5 minutes for the males ($p=0.012$), although after adjustment for potential confounding variables the association did not reach statistical significance ($p=0.342$). With regards to waiting time at the clinic, females (89.5 minutes) spent a significantly higher average waiting time than male respondents (77.25 minutes; $p=0.002$).

With respect to affordability, male participants had significantly lower odds of getting disability benefits (AOR, 0.48; 95% CI, [0.36, 0.63]) and were more likely to spend money on other providers compared with women. As illustrated in table 2, the female participants were seen, on average, to spend more on the direct costs of seeking TB treatment, as well as other health care services during the past month when

compared to the males. However, these inequalities in affordability by gender were not statistically significant (P -values > 0.05). Similarly, costs were catastrophic for a larger proportion of female respondents (33.98%) when compared to the males (31.9%), and a higher percentage of females borrowed money as a coping method to cover the health care expenditures ($p=0.364$).

Concerning the acceptability dimension of access to TB services, approximately 31.8% of females agreed that queues were too long, compared to 23.9% of male participants ($p=0.002$) whereby male participants had a significantly lower odds of perceiving or experiencing long queues (AOR, 0.69; 95% CI, [0.52, 0.91]).

Additionally, regarding cleanliness, a higher percentage of female respondents (14%) agreed that the health facilities were dirty compared to males (9.6%) who had a lower odds of perceiving the facilities to be dirty (AOR, 0.67; 95% CI, [0.46, 0.97]). Being negatively judged as the result of attending TB clinics is used as a proxy for stigma in this study, where a slightly higher percentage of women (13.7%) reported that they had been judged for their TB status, when compared with men (12.7%); however, the association found not to be statistically significant (AOR, 0.97; 95% CI, [0.68, 1.38]). Regarding other acceptability-related variables, the results distinctly show that larger female proportion, as compared to male respondents, agreed that health workers were too busy to answer their questions and that some staff do not treat patients with sufficient respect; although these results were found not to be significantly associated with gender, even after adjustment for potential confounding variables.

Adherence & gender differences in access to TB treatment

As illustrated in Table 2, the results of multivariate analysis of the association between adherence status and gender reveals that there is no statistically significant association between being adherent and gender (AOR, 1.18; 95% CI, [0.86, 1.6]), as well as level of non-adherence (reporting missed visits and reporting missed doses) and gender (AOR, 1.2; 95% CI, [0.84, 1.75] and AOR, 1.2; 95% CI, [0.89, 1.76], respectively).

Table 3 presents the results of the bivariate, unadjusted analysis of the association between each access dimension and gender, for different medication adherence levels. Overall, 82% (1008) of participants

Table 2. Access and adherence, by sex. (Controlling for age, SES, education, employment status, site, and duration on TB treatment)

| | Descriptive statistic | | | | Regression | | |
|--|-----------------------------|---------------------------|-------------------------|---------|--|---------|----------------------------|
| | All respondents (n=1229) | Females (n=643;52.32%) | Males (n=586;47.68%) | p-value | AOR or estimated regression coefficient | p-value | 95% Confidence interval |
| variables : | | | | | | | |
| Availability | | | | | | | |
| Mean travelling time to the clinic (minutes) | 35.48 | 36.40 | 34.48 | 0.012 | - 1.70 | 0.342 | (-5.22 , 1.81) |
| Transport by foot (%) | 56.64 | 55.92 | 57.44 | 0.592 | 1.04 | 0.733 | (0.81 , 1.34) |
| Mean waiting time at clinic for doctor/nurse visit (minutes) | 83.62 | 89.51 | 77.24 | 0.002 | - 10.7 | 0.059 | (- 22.01 , 0.42) |
| Mean waiting time at clinic to collect TB medication (minutes) | 34.7 | 37.62 | 31.56 | 0.333 | -7.06 | 0.029 | (- 13.54 , - 0.70) |
| Respondent receives clinic daily DOTs as service delivery model (%) | 33.50 | 32.40 | 34.70 | 0.393 | 1.38 | 0.128 | (0.91 , 2.10) |
| Affordability | | | | | | | |
| Respondent receives a disability (chronic care) grant (%) | 73.72 | 80.09 | 66.72 | <0.001 | 0.48 | <0.001 | (0.36 , 0.63) |
| Expenditure on other providers in the past month (ZAR) (mean) | 26.59 | 26.31 | 26.90 | 0.021 | - 0.18 | 0.053 | (- 0.38 , 0.002) |
| Expenditure on self-care in past month (ZAR) (mean) | 30.72 | 28.40 | 33.25 | 0.892 | 0.09 | 0.347 | (- 0.10 , 0.29) |
| Expenditure to reach and during TB facility visits in past month (ZAR) (mean) | 42.44 | 46.02 | 38.53 | 0.102 | - 0.11 | 0.305 | (- 0.33 , 0.10) |
| Total expenditure on healthcare in past month (ZAR) (mean) | 99.77 | 100.66 | 98.79 | 0.305 | - 0.01 | 0.875 | (- 0.26 , 0.22) |
| Households incurring healthcare costs >10% of household expenditure (%) | 32.99 | 33.98 | 31.90 | 0.468 | 0.93 | 0.652 | (0.71 , 1.23) |
| Respondent borrowed money to pay for healthcare in the past month (%) | 18.63 | 19.60 | 17.58 | 0.364 | 0.87 | 0.422 | (0.63 , 1.20) |
| Acceptability | | | | | | | |
| Respondent agrees that queues are too long (%) | 28.01 | 31.78 | 23.89 | 0.002 | 0.69 | 0.009 | (0.52 , 0.91) |
| Respondent agrees that some staff do not treat patients with sufficient respect (%) | 19.09 | 20.87 | 17.12 | 0.095 | 0.90 | 0.535 | (0.67 , 1.22) |
| Respondent agrees that the healthcare facility is dirty (%) | 11.09 | 14.00 | 9.59 | 0.017 | 0.67 | 0.033 | (0.46 , 0.97) |
| Respondent feels that people in the community judge him/her negatively for attending the TB facility (%) | 13.10 | 13.69 | 12.46 | 0.524 | 0.97 | 0.877 | (0.68 , 1.38) |
| Respondent reports that health worker was too busy to answer their questions (%) | 10.99 | 11.20 | 10.77 | 0.811 | 0.96 | 0.857 | (0.66 , 1.40) |
| Adherence | | | | | | | |
| Non-adherents (%) | 17.98 | 17.57 | 18.43 | 0.696 | 1.18 | 0.287 | (0.86 , 1.62) |
| Missed visits (%) | 13.43 | 13.06 | 13.82 | 0.697 | 1.20 | 0.296 | (0.84 , 1.75) |
| Missed doses (%) | 14.56 | 14.00 | 15.19 | 0.554 | 1.20 | 0.195 | (0.89 , 1.76) |

Table 3. Access and gender, at different adherence levels.

| variables | <i>Never missed TB medication (n=1008; 82%)</i> | | | <i>Respondents reporting missed visits (n=165; 13.4%)</i> | | | <i>Respondents reporting missed doses* (n=179; 14.6%)</i> | | |
|--|---|----------------|----------------|---|----------------|----------------|---|----------------|----------------|
| | <i>Males</i> | <i>Females</i> | <i>p-value</i> | <i>Males</i> | <i>Females</i> | <i>p-value</i> | <i>Males</i> | <i>Females</i> | <i>p-value</i> |
| Availability | | | | | | | | | |
| Mean travelling time to the clinic (minutes) | 35.92 | 37.41 | 0.043 | 23.95 | 27.38 | 0.064 | 29.17 | 31.72 | 0.221 |
| Transport by foot (%) | 55.14 | 53.40 | 0.580 | 74.07 | 65.48 | 0.230 | 64.04 | 70.79 | 0.337 |
| Mean waiting time at the clinic for doctor/nurse visit (minutes) | 79.53 | 89.24 | 0.016 | 61.60 | 91.32 | 0.012 | 72.55 | 93.02 | 0.063 |
| Mean waiting time at the clinic to collect TB medication (minutes) | 33.97 | 40.33 | 0.366 | 17.75 | 23.40 | 0.845 | 22.46 | 24.28 | 0.771 |
| Affordability | | | | | | | | | |
| Respondent receives a disability (chronic care) grant (%) | 67.99 | 80.57 | <0.001 | 60.49 | 79.75 | 0.007 | 60.67 | 76.67 | 0.021 |
| Expenditure on other providers in the past month (ZAR) | 29.71 | 27.13 | 0.209 | 8.16 | 28.41 | 0.001 | 15.85 | 16.04 | 0.050 |
| Expenditure on self-care in past month (ZAR) | 35.57 | 31.68 | 0.690 | 3.89 | 5.71 | 0.423 | 27.58 | 13.33 | 0.171 |
| Expenditure to reach and during TB facility visits in past month (ZAR) | 40.37 | 44.53 | 0.087 | 32.05 | 65.68 | 0.292 | 33.82 | 51.23 | 0.426 |
| Total expenditure on healthcare in the past month (ZAR) | 105.66 | 103.56 | 0.529 | 44.25 | 100.22 | 0.031 | 77.27 | 78.02 | 0.830 |
| Households incurring healthcare costs >10% of household expenditure (%) | 33.49 | 35.34 | 0.561 | 22.39 | 31.65 | 0.211 | 26.03 | 25.32 | 0.920 |
| Respondent borrowed money to pay for healthcare in the past month (%) | 18.62 | 19.43 | 0.742 | 8.64 | 21.43 | 0.022 | 14.61 | 17.78 | 0.565 |
| Acceptability | | | | | | | | | |
| Respondent agrees that queues are too long (%) | 23.22 | 30.38 | 0.011 | 29.63 | 38.55 | 0.228 | 28.09 | 38.20 | 0.152 |
| Respondent agrees that some staff do not treat patients with sufficient respect (%) | 15.97 | 20.79 | 0.049 | 17.28 | 19.05 | 0.769 | 23.60 | 17.78 | 0.337 |
| Respondent agrees that the healthcare facility is dirty (%) | 8.82 | 13.21 | 0.027 | 12.35 | 20.24 | 0.171 | 12.36 | 15.56 | 0.537 |
| Respondent feels that people in the community judge him/her negatively for attending the TB facility (%) | 12.55 | 13.58 | 0.627 | 13.58 | 11.90 | 0.747 | 11.24 | 14.44 | 0.521 |

* 123 participants (approximately 10 %) reported both missed visits and missed doses.

met the criteria for adherence. Of those classified as non-adherent, 13.4% (165) reported missed visits and 14.6% (179) reported missed doses (approximately 10% of participants reported both missed visits and missed doses). In terms of availability (Table 3 and

Figure 1), among those who were adherent to TB treatment, the mean travelling time reported by females (37.4 minutes) was significantly higher than male respondents (35.9 minutes). Similarly, among participants who reported missed visits mean

travelling time for females was significantly higher than males (27.4 versus 23.9 minutes, respectively). However, these findings may have less to do with the gender of patients than with the urban/rural setting as well as the service delivery model in those settings. Moreover, in both adherents and those who reported missed visits, females spent more waiting time at the clinic for health professional visit compared to men while this waiting time was slightly higher for female who reported missed visits (91.32 minutes) compared to adherent females (89.24 minutes).

With regards to affordability, at all self-reported adherence levels, the proportion of females who received disability grants was higher than the males, although females in non-adherent groups (79.75% of those who ever missed a visit and 76.67% of those who ever missed a dose) were less likely to get disability benefit in comparison with adherent females (80.57%). The mean expenditure on other health care providers, which includes costs incurred from visiting general practitioners (GPs) or traditional healers, for adherent men (R 29.71) was higher than adherent females (R 27.13) albeit the association was not found to be statistically significant ($p=0.209$). Among non-adherents, this expenditure was found to be significantly associated with gender, as women who reported missed visits (R 28.41) were seen to spend distinctly more on other providers than men (R 8.16).

Borrowing money as a coping strategy to deal with TB treatment expenditures was found to be more common in females compared to male patients at any adherence level in this study. However, the association between borrowing money and gender was statistically significant only among patients who reported missing visits. About 21% of females compared with 8.6% of males borrowed money in order to cover the TB-related expenditures ($p=0.022$).

With respect to perceptions of the acceptability of TB services among adherent patients, statistically significant results ($p=0.011$) showed that higher proportion of females (about 30%) agreed that the queues were too long in comparison with male participants (about 23%). Identically, among non-adherent participants (both reporting missed visits and missed doses), the percentage of females who believed that queues were too long was higher than the percentage of males, although the association was not statistically significant. Generally, the association between non-

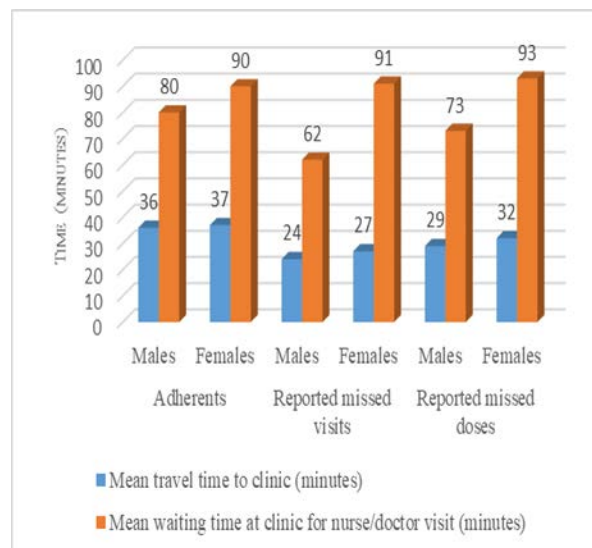


Figure 1. Time commitments associated with using TB services in different adherence levels, by gender.

adherence and length of queues were found not to be significant (AOR, 1.2; 95% CI, [0.87, 1.7]). The association between adherence and cleanliness of facilities were found to be significant in the sample (AOR, 1.7; 95% CI, [1.09, 2.69]). The participants who felt the facility is dirty were more likely to be non-adherent to TB treatment. In addition, a higher proportion of adherent females (13.2%) reported that health facilities were dirty as compared with adherent males (8.8%). This difference was distinctly higher among those who have reported missing TB visits, where 20.2% of females versus 12.3% of males reported that facilities were dirty; however, the association is not statistically significant ($p=0.171$).

Discussion

This study has assessed gender-related differences in access to TB services from the perspective of users interviewed in 12 facilities within two rural and two urban health sub-districts in South Africa. Gender-based inequalities in access barriers were appraised after controlling for differences in age, socioeconomic status (asset index), level of education, employment status, and site.

Before interpreting the results, it is important to mention the limitations of this study. First, this analysis is based on subjects who have gained access to primary health care facilities and have used TB treatment. Therefore, it should be considered that access barriers might be different for those who have never gained entry to the facilities. Moreover, patients with severe and drug-resistant forms of TB, who usually are

seeking care at secondary level facilities, are less likely to have been part of the study population. Hence, the findings are narrowed to patient populations who could access primary care facilities. Secondly, adherence status is assessed in accordance with patient reports of missed treatment doses and clinic visits. Consequently, there is a potential for recall and reporting biases that may have over-estimated the level of adherence. Third, despite the great emphasis on the importance of evaluating both health system and patient level forces influencing access to health services, this study is based on patients' views on access barriers and the health worker perspectives on accessing TB services are not captured. Under this circumstance, a number of principal barriers to treatment access are not explored due to the limited scope of this study. Fourth, according to related literature, access barriers are likely to be context specific, hence results from the four included settings may not be generalizable to other countries.

To our knowledge, this is the first study to explore gender-based inequalities in access to TB health care services in South Africa. Following the literature, TB can have associations with gender given that the social context can affect care-seeking behaviour, vulnerability to infection as well as treatment adherence [24]. In contrast, this study does not find much support for the association between gender and TB treatment access or adherence. With regards to the availability dimension of access, the only observed difference between men and women was the waiting time at the clinic to fetch TB medication. While not directly comparable, studies in Nepal [25], Bangladesh [26], and Viet Nam [27] found that women experience significantly longer diagnostic and TB treatment delays when compared to men. Moreover, women reported longer mean travelling time to the clinic. However, after controlling for other variables such as site, the difference was no longer significant. It might be explained by the fact that availability barriers are mostly context specific, hence after controlling for the variable "site", we could not find significant inequalities between two genders in terms of travel time to the facility. Considering the affordability dimension of access, the only detected difference between the two genders was receiving the disability grant where women reported better access to the grant. This grant was available to patients who were unfit to work as a result of illness and who had an annual income below R29 112 for single people or R58 224 for married people, at the time of primary data collection for REACH project. Based on the descriptive analysis of this study, a higher proportion of women were single and unemployed and therefore might face financial barriers to accessing TB services. In this way, we can argue that this difference in receiving disability grant may not be evidence of inequity between genders

and may also mitigate the potential inequalities in affordability of services between men and women.

While this study has revealed few associations between access and gender, findings concerning the acceptability dimension of access in this study show that there were differences between women and men in their perception of cleanliness of facilities as well as length of queues. We acknowledge that the data is old; however, it can be proven that our research findings are still useful. The data-set which is used for this analysis is based on the data from first-line TB patients who were on drug-sensitive TB treatment. Even though South Africa made considerable progress in TB control such as implementing new diagnostic tests (Xpert) and rolling out the latest second-line TB treatment programme in the past decade [4], the barriers of patients' access to TB services still remain.

Conclusion

This analysis has found very little evidence of gender-related access inequalities to TB services and no association between the level of adherence to TB-treatment and gender. However, the findings of this analysis reveal concerns about the condition and cleanliness of health facilities, which may be more of a barrier for women. This warrants a need to further explore the acceptability related factors of access to TB services, preferably by adopting both quantitative and qualitative approaches.

Acknowledgements

The data which this paper is based on was collected as part of the REACH project. REACH was carried out with support from the Global Health Research Initiative, a collaborative research funding partnership of the Canadian Institutes of Health Research, the Canadian International Development Agency, the International Development Research Centre and the Public Health Agency of Canada, Health Canada. The funders had no involvement in study design or data collection. We would like to thank the REACH team, the patients, as well as the health workers who agreed to be involved in this project.

Conflicts of Interest: None

Author Information

Mina Haji is a Master's student at the University of Cape Town, South Africa. Susan Cleary is an Associate Professor of Health Economics at the University of Cape Town.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

References

- [1] Krishnan, L., Akande, T., Shankar, A.V., McIntire, K.N., Gounder, C.R., Gupta, A. and Yang, W.T., 2014. Gender-related barriers and delays in accessing tuberculosis diagnostic and treatment services: a systematic review of qualitative studies. *Tuberculosis research and treatment*, 2014.
- [2] South African National AIDS Council, 2017. Let our actions count: South Africa's national strategic plan for HIV, TB and STIs 2017–2022.
- [3] Statistics South Africa, 2016. Mortality and causes of death in South Africa, 2015: Findings from death notification. Pretoria.
- [4] World Health Organization, 2018. Global tuberculosis report 2017. *World Health Organization*.
- [5] Gray, A. and Vawda, Y., 2017. Health policy and legislation. *South African Health Review*, 2017(1), pp.13-24.
- [6] O'Donnell, M.R., Wolf, A., Werner, L., Horsburgh, C.R. and Padayatchi, N., 2014. Adherence in the treatment of patients with extensively drug-resistant tuberculosis and HIV in South Africa: a prospective cohort study. *Journal of acquired immune deficiency syndromes (1999)*, 67(1), p.22.
- [7] Akolo, C., Adetifa, I., Shepperd, S. and Volmink, J., 2010. Treatment of latent tuberculosis infection in HIV infected persons. *Cochrane database of systematic reviews*, (1).
- [8] Meintjes, G., 2014. Management challenges in tuberculosis and HIV. *SAMJ: South African Medical Journal*, 104(12), pp.885-885.
- [9] Cox, H., Dickson-Hall, L., Jassat, W., Moshabela, M., Kielmann, K., Grant, A., Nicol, M., Black, J., Mlisana, K., Vanleeuw, L. and Loveday, M., 2017. Drug-resistant tuberculosis in South Africa: history, progress and opportunities for achieving universal access to diagnosis and effective treatment. *South African Health Review*, 2017(1), pp.157-167.
- [10] Lawn, SD. and Zumla, AI., 2011. Tuberculosis. *Lancet*. 2011(378), pp.57–72.
- [11] South African National Department of Health, 2008. National Tuberculosis Management Guidelines 2008.
- [12] Mukinda, F.K., Theron, D., Van der Spuy, G.D., Jacobson, K.R., Roscher, M., Streicher, E.M., Musekiwa, A., Coetzee, G.J., Victor, T.C., Marais, B.J. and Nachega, J.B., 2012. Rise in rifampicin-monoresistant tuberculosis in Western Cape, South Africa. *The International Journal of Tuberculosis and Lung Disease*, 16(2), pp.196-202.
- [13] Naidoo, P., Theron, G., Rangaka, M.X., Chihota, V.N., Vaughan, L., Brey, Z.O. and Pillay, Y., 2017. The South African tuberculosis care cascade: estimated losses and methodological challenges. *The Journal of infectious diseases*, 216(suppl_7), pp. S702-S713.
- [14] McIntyre, D.I., Thiede, M. and Birch, S., 2009. Access as a policy-relevant concept in low-and middle-income countries. *Health Economics, Policy and Law*, 4(2), pp.179-193.
- [15] Mooney, G., 2009. Is it not time for health economists to rethink equity and access?. *Health economics, policy and law*, 4(2), pp.209-221.
- [16] Thiede, M., Akweongo, P., McIntyre, D., McIntyre, D. and Mooney, G., 2007. Exploring the dimensions of access. *The economics of health equity*, pp.103-123.
- [17] Schneider, H., McIntyre, D. and Eyles, J., 2012. Researching Equity in Access to Health Care (REACH) Final Technical Report.
- [18] Braveman, P. and Gruskin, S., 2003. Defining equity in health. *Journal of Epidemiology & Community Health*, 57(4), pp.254-258.
- [19] Sabaté, E., 2003. Adherence to long-term therapies: evidence for action. *World Health Organization*.
- [20] Van Den Boogaard, J., Boeree, M.J., Kibiki, G.S. and Aarnoutse, R.E., 2011. The complexity of the adherence-response relationship in tuberculosis treatment: why are we still in the dark and how can we get out?. *Tropical medicine & international health*, 16(6), pp.693-698.
- [21] Booysen, F., Van Der Berg, S., Burger, R., Von Maltitz, M. and Du Rand, G., 2008. Using an asset index to assess trends in poverty in seven Sub-Saharan African countries. *World Development*, 36(6), pp.1113-1130.
- [22] Cleary, S.M., Birch, S., Moshabela, M. and Schneider, H., 2012. Unequal access to ART: exploratory results from rural and urban case studies of ART use. *Sex Transm Infect*, 88(2), pp.141-146.
- [23] Howe, L.D., Hargreaves, J.R. and Huttly, S.R., 2008. Issues in the construction of wealth indices for the measurement of socio-economic position in low-income countries. *Emerging themes in epidemiology*, 5(1), p.3.
- [24] van den Hof, S., Najlis, C.A., Bloss, E. and Straetemans, M., 2010. A systematic review on the role of gender in tuberculosis control. *Report prepared for Tuberculosis Control Programme (TB CAP)*. September.
- [25] Begum, V., De Colombani, P., Das Gupta, S., Salim Md A, H., Hussain, H., Pietroni, M., Rahman, S., Pahan, D. and Borgdorff, M., 2001. Tuberculosis and patient gender in Bangladesh: sex differences in diagnosis and treatment outcome. *The International Journal of Tuberculosis and Lung Disease*, 5(7), pp.604-610.
- [26] Karim, F., Islam, M.A., Chowdhury, A.M.R., Johansson, E. and Diwan, V.K., 2007. Gender differences in delays in diagnosis and treatment of tuberculosis. *Health policy and planning*, 22(5), pp.329-334.
- [27] Thorson, A. and Diwan, V.K., 2001. Gender inequalities in tuberculosis: aspects of infection, notification rates, and compliance. *Current opinion in pulmonary medicine*, 7(3), pp.165-169.

Bibliography

- Akolo, C., Adetifa, I., Shepperd, S. and Volmink, J., 2010. Treatment of latent tuberculosis infection in HIV infected persons. *Cochrane database of systematic reviews*, (1).
- Begum, V., De Colombani, P., Das Gupta, S., Salim Md A, H., Hussain, H., Pietroni, M., Rahman, S., Pahan, D. and Borgdorff, M., 2001. Tuberculosis and patient gender in Bangladesh: sex differences in diagnosis and treatment outcome. *The International Journal of Tuberculosis and Lung Disease*, 5(7), pp.604-610.
- Booyesen, F., Van Der Berg, S., Burger, R., Von Maltitz, M. and Du Rand, G., 2008. Using an asset index to assess trends in poverty in seven Sub-Saharan African countries. *World Development*, 36(6), pp.1113-1130.
- Braveman, P. and Gruskin, S., 2003. Defining equity in health. *Journal of Epidemiology & Community Health*, 57(4), pp.254-258.
- Cleary, S.M., Birch, S., Moshabela, M. and Schneider, H., 2012. Unequal access to ART: exploratory results from rural and urban case studies of ART use. *Sex Transm Infect*, 88(2), pp.141-146.
- Cox, H., Dickson-Hall, L., Jassat, W., Moshabela, M., Kielmann, K., Grant, A., Nicol, M., Black, J., Mlisana, K., Vanleeuw, L. and Loveday, M., 2017. Drug-resistant tuberculosis in South Africa: history, progress and opportunities for achieving universal access to diagnosis and effective treatment. *South African Health Review*, 2017(1), pp.157-167.
- Gray, A. and Vawda, Y., 2017. Health policy and legislation. *South African Health Review*, 2017(1), pp.13-24.
- Howe, L.D., Hargreaves, J.R. and Huttly, S.R., 2008. Issues in the construction of wealth indices for the measurement of socio-economic position in low-income countries. *Emerging themes in epidemiology*, 5(1), p.3.
- Karim, F., Islam, M.A., Chowdhury, A.M.R., Johansson, E. and Diwan, V.K., 2007. Gender differences in delays in diagnosis and treatment of tuberculosis. *Health policy and planning*, 22(5), pp.329-334.
- Krishnan, L., Akande, T., Shankar, A.V., McIntire, K.N., Gounder, C.R., Gupta, A. and Yang, W.T., 2014. Gender-related barriers and delays in accessing tuberculosis diagnostic and treatment services: a systematic review of qualitative studies. *Tuberculosis research and treatment*, 2014.
- Lawn, SD. and Zumla, Al., 2011. Tuberculosis. *Lancet*. 2011(378), pp.57–72.
- McIntyre, D.I., Thiede, M. and Birch, S., 2009. Access as a policy-relevant concept in low-and middle-income countries. *Health Economics, Policy and Law*, 4(2), pp.179-193.
- Meintjes, G., 2014. Management challenges in tuberculosis and HIV. *SAMJ: South African Medical Journal*, 104(12), pp.885-885.
- Mooney, G., 2009. Is it not time for health economists to rethink equity and access?. *Health economics, policy and law*, 4(2), pp.209-221.
- Mukinda, F.K., Theron, D., Van der Spuy, G.D., Jacobson, K.R., Roscher, M., Streicher, E.M., Musekiwa, A., Coetzee, G.J., Victor, T.C., Marais, B.J. and Nachega, J.B., 2012. Rise in rifampicin-monoresistant tuberculosis in Western Cape, South Africa. *The International Journal of Tuberculosis and Lung Disease*, 16(2), pp.196-202.

- Naidoo, P., Theron, G., Rangaka, M.X., Chihota, V.N., Vaughan, L., Brey, Z.O. and Pillay, Y., 2017. The South African tuberculosis care cascade: estimated losses and methodological challenges. *The Journal of infectious diseases*, 216(suppl_7), pp. S702-S713.
- O'Donnell, M.R., Wolf, A., Werner, L., Horsburgh, C.R. and Padayatchi, N., 2014. Adherence in the treatment of patients with extensively drug-resistant tuberculosis and HIV in South Africa: a prospective cohort study. *Journal of acquired immune deficiency syndromes (1999)*, 67(1), p.22.
- Sabaté, E., 2003. Adherence to long-term therapies: evidence for action. *World Health Organization*.
- Schneider, H., McIntyre, D. and Eyles, J., 2012. Researching Equity in Access to Health Care (REACH) Final Technical Report.
- South African National AIDS Council, 2017. Let our actions count: South Africa's national strategic plan for HIV, TB and STIs 2017–2022.
- South African National Department of Health, 2008. National Tuberculosis Management Guidelines 2008.
- Statistics South Africa, 2016. Mortality and causes of death in South Africa, 2015: Findings from death notification. Pretoria.
- Thiede, M., Akweongo, P., McIntyre, D., McIntyre, D. and Mooney, G., 2007. Exploring the dimensions of access. *The economics of health equity*, pp.103-123.
- Thorson, A. and Diwan, V.K., 2001. Gender inequalities in tuberculosis: aspects of infection, notification rates, and compliance. *Current opinion in pulmonary medicine*, 7(3), pp.165-169.
- Van Den Boogaard, J., Boeree, M.J., Kibiki, G.S. and Aarnoutse, R.E., 2011. The complexity of the adherence-response relationship in tuberculosis treatment: why are we still in the dark and how can we get out?. *Tropical medicine & international health*, 16(6), pp.693-698.
- van den Hof, S., Najlis, C.A., Bloss, E. and Straetmans, M., 2010. A systematic review on the role of gender in tuberculosis control. *Report prepared for Tuberculosis Control Programme (TB CAP). September*.
- World Health Organization, 2018. Global tuberculosis report 2017. *World Health Organization*.

PART D: POLICY BRIEF

Differences in access to Tuberculosis services in South Africa

Does gender matter?



Health Economics Unit
*School of Public Health &
 Family Medicine*
 University of Cape Town

Source: This policy brief is based on a journal article titled “gender inequalities in access to Tuberculosis services in South Africa”.

Authors: The research was conducted by Mina Haji from the Health Economics Unit, University of Cape Town and Dr. Susan Cleary from the Health Economics Unit, University of Cape Town.

For more information about this policy brief:
 please contact:
HJXMIN001@uct.ac.za

HEU Policy Briefs present summarised research findings and key policy recommendations on important health care policy issues in Sub-Saharan Africa.

Executive summary

The Tuberculosis (TB) epidemic is one of the significant public health challenges in South Africa. Although differences in access and adherence to TB treatment may have gender dimensions, these barriers to TB access have been an overlooked subject. This brief is from the paper “gender inequalities in access to Tuberculosis services in South Africa.” This policy brief provides an understanding of gender-related differences in adherence and access to TB health care services in South Africa, by analysing the adherence status as well as exploring the extent to which TB services are affordable, acceptable, and available to men and women. Findings suggest that access to TB-treatment in South Africa is equitable for both genders.

Introduction

TB is the leading cause of mortality in South Africa and the country has the sixth-highest TB burden in the world. Of every 100 000 South Africans, 781 are expected to develop TB. Regardless of adoption of the Directly Observed Treatment, Short-Course (DOTS) strategy since 1996 and considerable investments and improvement in TB control, South Africa has not met the TB-related targets set by the World Health Organization (WHO). The current burden of TB is expected to lead to mortality and morbidity in addition to substantial financial implications for the health system. Considering the infectious nature of TB as a communicable disease, for the sake of controlling the level and spread of the disease and preventing drug resistance, adherence to treatment is essential. Moreover, the burden of non-adherence to TB treatment has been affirmed as one of the primary challenges facing global control of TB pandemic. The

Key points and policy implications:

- In South Africa, levels of adherence to TB-treatment were found not to be associated with gender.
- There was no evidence of systematic gender-based differences in access to TB services.
- There exist concerns about the condition and cleanliness of health facilities that may impact the patients' adherence and be a barrier, particularly, in women's use of TB services.
- Improving the physical structure, layout, and the cleanliness of facilities are critical for achieving improved access to healthcare.

accessibility of needed care influences the adherence to treatment and in a situation in which non-adherence is the consequence of unjust and avoidable barriers, equity issue stresses its importance. Both barriers and facilitating factors to access and adherence to TB treatment are affected by different social determinants of health inclusive of gender.

Even though the TB services are free at the point of use in South African public health

facilities, much is unknown about overall barriers and gender-based inequalities in access to TB services and their association with TB treatment adherence. Reaching the WHO policy goal of reducing the TB incidence rate in South Africa to less than 167 cases per 100 000 population and mortality to less than 9800 by the year 2030, requires an understanding of the nature of the barriers being faced by TB patients, regardless of their gender.

Methods

This study is a sub-component of the Researching Equity and Access to Health Care (REACH) project, a five-year multi-method study of equity in access to maternal deliveries, Antiretroviral Therapy (ART), and TB treatment in four South African provinces.



During 2008/09, a representative sample of 1229 TB patients was interviewed within 30 TB facilities in two rural (Bushbuckridge in Mpumalanga Province and Hlabisa in Northern KwaZulu Natal) as well as two urban settings (Mitchells Plain in the Cape Metropole, Western Cape Province; and Soweto in the City of Johannesburg, Gauteng Province). Users were asked to report socioeconomic and demographic information along with information concerning key access barriers to TB-treatment. Respondents were considered 'adherent' if they reported having no missed visits or missed doses of TB-medication and they were considered 'non-adherent' if they reported having missed visits or missed doses of TB-medication.

Findings

Gender differences in access to TB treatment

- Regarding affordability (financial access) of TB services, women were more likely to receive a disability grant. Although not statistically significant, the female participants were seen, on average, to spend more on the direct costs of seeking TB treatment, as well as other health care services during the past month and costs were catastrophic for a larger proportion of women when compared to the

men. Also, a higher percentage of females borrowed money as a coping method to cover the healthcare expenditures.

- Regarding availability (physical access) of TB services, men spent less time at the clinic to fetch TB medication. Moreover, female participants on average spent more time travelling to the facilities than males, yet this association was not statistically significant.

- Concerning the acceptability of TB services, women were less satisfied with the cleanliness of the facilities and the length of queues.

Gender differences in access to TB treatment

- Among the respondents, 82.4% of women and 81.6% of men reported being adherent to TB-treatment. There was no association between the level of adherence and gender.

Adherence & gender differences in access to TB treatment

- In terms of availability (Figure 1), among those who were adherent to TB treatment, the mean travelling time reported by females was significantly higher than male respondents. Similarly, among participants who reported missed visits, mean travelling time for females was significantly higher than males. Furthermore, in both adherents and those who reported missed visits, women spent more waiting time at the clinic for health professional visit compared to men while this waiting time was slightly higher for women who reported missed visits compared to adherent women.

- Regarding affordability, at all self-reported adherence levels, the proportion of women who received disability grants was higher than the men, although women in non-adherent groups were less likely to get disability benefit in comparison with adherent women.

- Concerning acceptability, the participants who felt the facility was dirty were more likely to be non-adherent to TB treatment. In addition, a higher proportion of adherent females reported that health facilities were dirty as compared with adherent males.

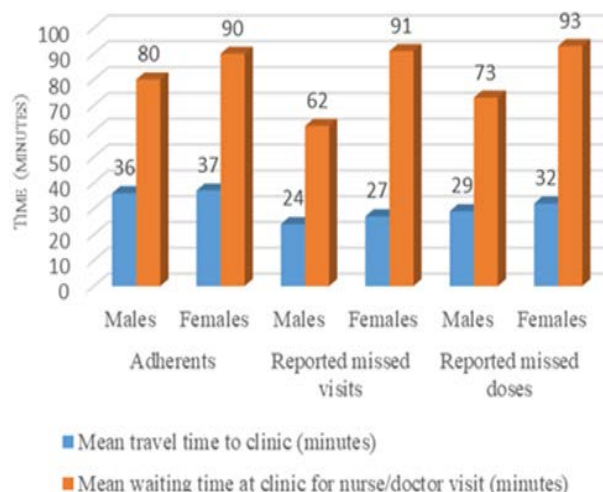


Figure 1. Time commitments associated with using TB services in different adherence levels, by gender.

What do these findings mean?

These findings suggest little or no association between gender and barriers to accessing TB services, and no association between the level of adherence to TB-treatment and gender. However, the findings of this analysis reveal concerns about the condition and cleanliness of health facilities, which may be more of a barrier for women.

Acknowledgements: The findings presented in this policy brief were based on data collected as part of the REACH project. REACH was carried out with support from the Global Health Research Initiative, a collaborative research funding partnership of the Canadian Institutes of Health Research, the Canadian International Development Agency, the International Development Research Centre and the Public Health Agency of Canada, Health Canada. The funders had no involvement in study design or data collection. The authors thank the REACH team, the patients, and the health workers who agreed to be involved in this project. We acknowledge that the findings, conclusions and expressed views are the responsibility of the authors and the funders accept no accountability on this subject.

For a complete list of the references, please contact the author.

Bibliography

- Foster, N., Vassall, A., Cleary, S., Cunnama, L., Churchyard, G. and Sinanovic, E., 2015. The economic burden of TB diagnosis and treatment in South Africa. *Social science & medicine*, 130, pp.42-50.
- Naidoo, P., Theron, G., Rangaka, M.X., Chihota, V.N., Vaughan, L., Brey, Z.O. and Pillay, Y., 2017. The South African tuberculosis care cascade: estimated losses and methodological challenges. *The Journal of infectious diseases*, 216(suppl_7), pp. S702-S713.
- Sabaté, E., De Geest, S., 2003. Adherence to long-term therapies: Evidence for action. *European Journal of Cardiovascular Nursing* 2, 323.
- SANAC, 2017. Let our actions count: South Africa's national strategic plan for HIV, TB and STIs 2017-2022. *The South African National AIDS Council*.
- Schneider, H., McIntyre, D., Eyles, J., 2012. Researching Equity in Access to Health Care (REACH).
- Van Den Boogaard, J., Boeree, M.J., Kibiki, G.S. and Aarnoutse, R.E., 2011. The complexity of the adherence-response relationship in tuberculosis treatment: why are we still in the dark and how can we get out?. *Tropical medicine & international health*, 16(6), pp.693-698.
- World Health Organization, 2018. Global tuberculosis report 2017. *Google Scholar*.

PART E: APPENDICES

Appendices

Appendix A: Patient Exit Interview Questionnaire for TB tracer, adopted from REACH report (Schneider *et al.*, 2012).

REACH
PATIENT EXIT INTERVIEW CONSENT FORM
tracer: TB

CONSENT TO PARTICIPATE IN THE EXIT INTERVIEW

Facility: *[enter name of facility]* _____

I have been informed about the project *Researching equity in access to health care*, and I understand that it is up to me whether or not to be interviewed.

I understand that there will be no consequences of any kind through my responding to this questionnaire; in particular, there will be no impact on the care that I receive in this hospital.

I understand that I can ask the person interviewing me to stop the interview at any time.

I understand that the information that I give will be treated in the strictest confidence and that my name will not be used when the interviews are analysed.

Yes, I give my permission for the interview ☐

Interviewee's signature

Date

Interviewer's name (please print)

Interviewer's signature

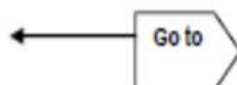
Date

| REACH | |
|--------------------------------------|---|
| PATIENT EXIT INTERVIEW QUESTIONNAIRE | |
| tracer: TB | |
| 0.1 Date of interview | <div> <div></div> <div></div> <div></div> </div> <div> <div>dd</div> <div>mm</div> <div>yyyy</div> </div> |
| 0.2 Interviewer name | <div></div> |
| 0.3 Patient number | <div>Place sticker here</div> |
| 0.4 Start time of interview | <div> <div></div> <div>:</div> <div></div> </div> <div> <div>hour</div> <div>min</div> </div> |
| 0.5 Site (name of facility) | <div></div> |

Instructions for interviewers:

Questions or parts of questions that do not always need to be read out and instructions are in highlighted text.

Skips indicating which questions can be left out are indicated by arrows



Unless specifically asked to do so, options do not need to be read out.

SECTION 1: SOCIOECONOMIC AND DEMOGRAPHIC BACKGROUND QUESTIONS ABOUT THE RESPONDENT, HIS/HER HOUSEHOLD AND HOUSEHOLD HEAD

READ OUT:

I am going to start by asking you a few questions about you and your household. When I talk about your household, I am including all the people who live in your house and who share the same food with you.

When I talk about your household head, this is the person who usually makes the important decisions in the household.

| | | | |
|---|--|---|-------|
| 1.1 Sex | | Male | 1 |
| | | Female | 2 |
| 1.2 Note the race of the respondent. If you are not certain, ask: How would you describe yourself racially? | | African/Black | 1 |
| | | Coloured | 2 |
| | | Asian/Indian | 3 |
| | | White | 4 |
| | | Other (specify) | |
| 1.3 What was your age at your last birthday? Fill in one block only | | Year born | Years |
| 1.4 Who is the head of your household? By this, I mean, who is the person who usually makes the important decisions in the household. Indicate relationship e.g. father, mother not name. | | Relationship | |
| 1.5 Code sex of HHH. If not clear ask: What is the sex of your HHH? | | Male | 1 |
| | | Female | 2 |
| 1.6 Code position in HH of respondent. If unclear, ask: What is your position in the household, in relation to the household head such as ...read out a few relevant options. Tick one block only | | Head/acting head | 1 |
| | | Husband/wife/partner | 2 |
| | | Son/daughter/stepchild/adopted child | 3 |
| | | Brother/sister/step brother/step sister | 4 |
| | | Father/mother/step father/step mother | 5 |
| | | Grandparent/great grandparent | 6 |
| | | Grandchild/great grandchild | 7 |
| | | Other relative (e.g. in laws or aunt/uncle) | 8 |
| | | Non-related persons (tenant, boarder, lodger) | 9 |
| | | Don't know | 99 |
| | | Other (specify) | |
| 1.7 What was the age of your HHH i.e. husband / father / mother etc. at his/her last birthday? fill in one block only | | Year born | Years |
| 1.8 Does your HHH i.e. husband / father / mother etc. stay with you for at least 2 weeks each month? | | Yes | 1 |
| | | No | 0 |

If respondent HHH, go to 1.9

| | | | |
|---|---|---|---|
| 1.9 What is your current marital status? Tick one block only | | Married Living with partner Widow/widower Divorced or separated Never married (single) Other (specify) | 1 2 3 4 5 |
| 1.10 What is YOUR highest level of education? Tick one block only If the person is NOT the HHH ask What is the highest level of education of your HHH i.e. husband / father / mother etc. | Type of education No schooling Highest grade passed in school (1-12) Completed diploma/certificate Completed degree Other (specify) | You 0 13 14 | Your HHH 0 13 14 |
| 1.11 Are you currently employed working or earning money? If the person is NOT the HHH ask Is your HHH i.e. husband / father / mother etc. currently employed? | Type of employment Yes, full-time Yes, part-time No Don't know Type of employment Self-employed Employee Don't know | You 1 2 3 99 You 1 2 99 | Your HHH 1 2 3 99 Your HHH 1 2 99 |
| 1.12 If respondent employed ask: Are you self-employed or do you work for someone else? If HHH employed, ask Is your HHH i.e. husband / father / mother etc. self-employed or does HE/SHE work for someone else? | | If no or don't know go to 1.13 Go to 1.14 | |
| 1.13 If respondent not employed ask: What are the reasons that you are not employed? Tick all that apply "Yes" and others "No" | Reason Studying Looking for work Retired or pensioner Sick or injured Pregnant or caring for own children Caring for other children Caring for sick/injured Retrenched Nothing Don't know Other (specify) | Yes 1 1 1 1 1 1 1 1 1 1 | No 0 0 0 0 0 0 0 0 0 99 |
| 1.14 Including yourself, how many adults (18 years or older) live in your household? When I talk about your household, I am including all the people who live in your house and who share the same food with you. | | | |
| 1.15 How many children younger than 18 years live in your household? | | | |

| | | | | | |
|--|------------------------------|-----------------|----|-------------------------|---------------------|
| 1.16 Does anyone in your household receive a government grant OR income from the government such as.....read out each option and tick yes or no. IF YES ask: How many of each type of grant is received (i.e. how many people receive each?) | Type of grant | Yes | No | If yes, number received | If no DG go to 1.19 |
| | Unemployment insurance (UIF) | 1 | 0 | | |
| | Worker's compensation | 1 | 0 | | |
| | State old age pension | 1 | 0 | | |
| | Disability grant | 1 | 0 | | |
| | Child support grant | 1 | 0 | | |
| | Care dependency grant | 1 | 0 | | |
| | Foster care grant | 1 | 0 | | |
| | Grant in aid | 1 | 0 | | |
| | Social relief | 1 | 0 | | |
| | Other | 1 | 0 | | |
| | Don't know | | 99 | | |
| 1.17 If someone in the household receives a disability grant, ask Is it you that receives the disability grant? | | Yes | 1 | If no go to 1.19 | |
| | | No | 0 | | |
| 1.18 If YES ask: What is the reason that you receive this disability grant? | | | | | |
| 1.19 If NO ask: Have you applied for a disability grant? | | Yes | 1 | | |
| | | No | 0 | | |
| 1.20 Where were you born? READ OUT I know this is a sensitive question to ask at this stage, but we are asking because we want to see if health services treat South Africans differently to those who are not from South Africa. | | South Africa | 1 | If other go to 1.22 | |
| | | Other (specify) | | | |
| 1.21 If respondent born in South Africa, ask: Which province were you born in? Use current province borders | | Western Cape | 1 | Go to 1.23 | |
| | | Eastern Cape | 2 | | |
| | | Northern Cape | 3 | | |
| | | Free State | 4 | | |
| | | KwaZulu-Natal | 5 | | |
| | | North West | 6 | | |
| | | Gauteng | 7 | | |
| | | Mpumalanga | 8 | | |
| | | Limpopo | 9 | | |
| | | Don't Know | 99 | | |
| 1.22 If respondent not born in South Africa, ask: Do you have a South African ID document? | | Yes | 1 | | |
| | | No | 0 | | |
| 1.23 Are you covered by a Medical Aid or any scheme that helps you pay for health-care services or medicines? | | Yes | 1 | | |
| | | No | 0 | | |

SECTION 2: UTILISATION OF TB AND OTHER HEALTH SERVICES AND INDIRECT COSTS OF THE DISEASE

READ OUT: In this section we are asking you some questions about what health care you have used for your TB.

| | | | |
|--|--------------------------------|--|-------------------|
| 2.1 Is this the first time you have had TB? | | Yes | 1 |
| | | No | 0 |
| 2.2 During this current episode, when did you start taking your TB treatment?? | | MM | YYYY |
| 2.3 Where were you diagnosed with TB? | Facility name/mobile clinic | | |
| | Province/city/village/township | | |
| 2.4 Have you been offered an HIV test (during this current treatment episode) | | Yes | 1 |
| | | No | 0 |
| | | Don't know | 99 |
| 2.5 How often do you collect your TB treatment here at the clinic? | | Daily during the week | 1 |
| | | Weekly | 2 |
| | | Monthly | 3 |
| | | Other (specify) | |
| 2.6 Who checks that you have taken your TB treatment each day? i.e. what form of DOTS does the patient receive? | | The TB DOTS sister or counsellor in the clinic (clinic DOTS) | 1 |
| | | A community worker (community DOTS) | 2 |
| | | Someone at my place of work (workplace DOTS) | 3 |
| | | No-one | 4 |
| | | Other (specify) | |
| 2.7 During this current treatment episode, have you received TB treatment from a clinic other than this one? | | Yes | 1 |
| | | No | 0 |
| 2.8 Besides TB, are you able to get the other health services you need in this facility? | | Yes | 1 |
| | | No | 0 |
| 2.9 If NO ask: Which services do you have to get elsewhere? | | | |
| READ OUT: Some people find it quite hard to stick to their TB treatment and might not always be able to make their appointments at the clinic. We are now going to ask you about whether you have had any of these sorts of problems and what the reasons might be. | | | |
| 2.10 Did you miss taking any of your TB tablets YESTERDAY? | | Yes | 1 |
| | | No | 0 |
| 2.11 Did you miss taking any TB tablets the day before YESTERDAY? | | Yes | 1 |
| | | No | 0 |
| 2.12 Did you miss taking any TB tablets 3 DAYS AGO? Specify the calendar day in relation to the day of the interview | | Yes | 1 |
| | | No | 0 |
| 2.13 Apart from the last three days, have you ever missed taking any tablets? | | Yes | 1 |
| | | No | 0 |
| 2.14 Have you missed any of the | Type of visit | Yes | No |
| | | N/A | If YES, how many? |

If yes go to 2.10

If all no go to 2.16

| | | | | | |
|---|---------------------------|---|---|----|--|
| following since you started TB treatment for this current episode | Daily DOTS visit | 1 | 0 | 98 | |
| | Nurse/doctor clinic visit | 1 | 0 | 98 | |
| | TB treatment collection | 1 | 0 | 98 | |

| | | | |
|---|---|------------|-----------|
| 2.15 For the last appointment missed, what was your reason(s)? Do not read the list aloud; probe respondent to give you up to three reasons Tick up to three yes options and tick all others no | Reason | Yes | No |
| | Lack of money | 1 | 0 |
| | Lack of time | 1 | 0 |
| | I felt better | 1 | 0 |
| | I could not take time off from work | 1 | 0 |
| | No transport | 1 | 0 |
| | Too ill to travel | 1 | 0 |
| | Other responsibilities | 1 | 0 |
| | The treatment is not effective / does not make me feel better | 1 | 0 |
| | The queues in the facility are too long | 1 | 0 |
| | The staff are rude or uncaring | 1 | 0 |
| | I have had bad experiences with staff in the past | 1 | 0 |
| | Don't know | 99 | |
| | Other 1 (specify) | | |
| | Other 2 (specify) | | |

| | | | | | |
|---|---|------------|-----------|---------------------------|-----------------------------|
| 2.16 Apart from visits to this clinic for your TB, have you used this clinic or any other health service in the last four weeks? Specify in relation to the calendar date Read out each option one at a time. IF YES ask: How many visits (or inpatient days) did you have? Then ask: How much did you have to pay the provider for each? Tick all that apply "Yes" and others "No" | Type of facility or service | Yes | No | If yes, times used | If yes, amount spent |
| | Chemist/pharmacy | 1 | 0 | | |
| | This clinic (not for TB) | 1 | 0 | | |
| | A different public clinic | 1 | 0 | | |
| | A private doctor | 1 | 0 | | |
| | A traditional healer | 1 | 0 | | |
| | A public hospital emergency/ outpatient department | 1 | 0 | | |
| | Inpatient stay in a public hospital | 1 | 0 | | |
| | A private hospital emergency/ outpatient department | 1 | 0 | | |
| | Inpatient stay in a private hospital | 1 | 0 | | |
| | ARV (HIV) clinic | 1 | 0 | | |
| | Antenatal clinic [women only] | 1 | 0 | | |
| Other (Specify) | | | | | |

| | | |
|---|------------------------|----------|
| 2.17 Have you spent any other money on health care in the past month (e.g. traditional medicines, spaza shops, special food, etc). If YES, how much have you spent? | Yes | 1 |
| | No | 0 |
| | If Yes, specify amount | |
| | | (Rand) |

SECTION 3: AFFORDABILITY

READ OUT I am now going to ask you some questions about the financial difficulties you might face in seeking health care for your TB.

| | | | |
|--|--|----------------------------|-----------|
| 3.1 In the last month did you have to borrow money to pay for healthcare? | | Yes | 1 |
| | | No | 0 |
| <div style="border: 1px solid black; padding: 2px; display: inline-block;">If no go to 3.3</div> | | | |
| 3.2 If YES How much money did you borrow? | | (Rand) | |
| 3.3 In the last month did you have to sell personal or household items in order to pay for healthcare? | | Yes | 1 |
| | | No | 0 |
| 3.4 How much time did you spend at the clinic last time you came for DOTS | | hrs | minutes |
| 3.5 How much time did you spend at the clinic last time you came to see the doctor/nurse for your TB? | | hrs | minutes |
| 3.6 What would you have been doing if you weren't at the clinic today? Tick all that apply "Yes" and others "No" | Activity | Yes | No |
| | Working | 1 | 0 |
| | Doing unpaid community work or volunteer work | 1 | 0 |
| | Doing household chores such as cleaning, cooking, shopping for food, maintenance and repairs, working in the garden, gathering wood, gathering water, housework etc. | 1 | 0 |
| | Taking care of children | 1 | 0 |
| | Leisure activities (sport, watching TV, listening to music, reading, visiting friends and family, going to movies etc) | 1 | 0 |
| | Attending school or other educational institution | 1 | 0 |
| | Nothing | 1 | 0 |
| | I don't know | 00 | |
| | Other (specify) | | |
| 3.7 In coming to receive treatment today, how much did you pay for: Read out each item. If no money spent, code as "0" for each item | Category | Rand | |
| | Transport (one way) | | |
| | Clinic fees | | |
| | Medicines | | |
| | Someone to take over your tasks while you are here including childcare | | |
| | Accommodation if you need to stay the night nearby | | |
| | Food during visit | | |
| | Phoning or sms'ing | | |
| Other, specify: | | | |
| <div style="border: 1px solid black; padding: 2px; display: inline-block;">If no expense, go to 3.9</div> | | | |
| 3.8 Did you find it easy or difficult to incur these expenses? Refer to expenses in 3.7 | | Easy | 1 |
| | | Difficult | 2 |
| | | Neither easy nor difficult | 3 |
| | | Don't know | 00 |
| 3.9 If respondent is working Did you lose income from the time you took from your job to come here today? | | Yes | 1 |
| | | No | 0 |
| <div style="border: 1px solid black; padding: 2px; display: inline-block;">If no go to 3.11</div> | | | |
| 3.10 If YES: How much money did you lose? | | (Rand) | |
| 3.11 Who, if anyone, has been helping you financially, i.e. with cash, buying food, | Person | Yes | No |
| | Husband/wife | 1 | 0 |

| | | | |
|---|--|---|----|
| providing transport etc, with your TB? | Father/mother | 1 | 0 |
| Tick all that apply "Yes" and all others "No" | Boyfriend/girlfriend | 1 | 0 |
| | Other relatives | 1 | 0 |
| | Friends | 1 | 0 |
| | Nobody | 1 | 0 |
| | Employer (over and above normal wages) | 1 | 0 |
| | Don't know | | 00 |
| | Other (specify) | | |

SECTION 4: AVAILABILITY

| | | |
|--|-----|---|
| 4.1 Is this the closest clinic to your home that offers TB treatment? | Yes | 1 |
| | No | 0 |

If yes
go to
4.3

| | |
|---|--|
| 4.2 If NO ask: Why do you prefer this facility? | |
|---|--|

| | | |
|---|------------|----|
| 4.3 Are the opening hours of this clinic convenient for you? | Yes | 1 |
| | No | 0 |
| | Don't know | 00 |

| | | | |
|---|---|-----|----|
| 4.4 How did you get here today? Tick all that apply "Yes" and all others "No" | Transport mode | Yes | No |
| | By foot | 1 | 0 |
| | Bicycle | 1 | 0 |
| | Minibus taxi | 1 | 0 |
| | Bus / Train | 1 | 0 |
| | Own private car | 1 | 0 |
| | Other private car (can be meter taxi, hired car, catching a lift) | 1 | 0 |
| | Ambulance / hospital transport | 1 | 0 |
| | Other (specify) | | |

| | | |
|---|-----|---------|
| 4.5 How long did it take you to get here? (one way only) time taken from leaving home to arriving at facility | hrs | minutes |
|---|-----|---------|

SECTION 5: ACCEPTABILITY

| | | |
|---|-----|---|
| 5.1 Have you told anyone besides the health care workers that you have TB? | Yes | 1 |
| | No | 0 |

If no
go to
5.3

| | |
|--|--|
| 5.2 If YES: Who have you told about your TB? Indicate relationship e.g. sister, not name. | |
|--|--|

| | | |
|---|----------------|----|
| 5.3 To what extent do you agree with the following statement: "I have all the support from my partner that I need to cope with my illness?" | Agree | 1 |
| | Disagree | 2 |
| | Don't know | 00 |
| | Not applicable | 00 |

| | | |
|---|-------------------------|----|
| 5.4 "I have all the support that I need from my family" | Agree | 1 |
| | Disagree | 2 |
| | Don't know | 99 |
| | Not applicable | 98 |
| 5.5 "I have all the support that I need from my friends" | Agree | 1 |
| | Disagree | 2 |
| | Don't know | 99 |
| | Not applicable | 98 |
| 5.6 Do you feel that people in the community judge you negatively for attending this facility for your TB treatment? | Yes | 1 |
| | No | 0 |
| | Don't know | 99 |
| 5.7 In general, when you need to seek healthcare, what do you prefer: c) To see a nurse in a nearby clinic or d) To travel further to see a doctor | Nurse | 1 |
| | Doctor | 2 |
| | Indifferent | 3 |
| | Don't know | 99 |
| 5.8 In this clinic are you able to talk to the doctors or nurses in private? | Always | 1 |
| | Sometimes | 2 |
| | Never | 3 |
| READ OUT: Can you tell me whether you agree or disagree with these statements when thinking about your general experience in this clinic? | | |
| 5.9 The queues to see a doctor or nurse are too long at this facility | Agree | 1 |
| | Disagree | 0 |
| | Both agree and disagree | 2 |
| | Don't know / not sure | 99 |
| 5.10 The doctors and nurses (<i>health workers</i>) discussed the treatment fully with me | Agree | 1 |
| | Disagree | 0 |
| | Both agree and disagree | 2 |
| | Don't know / not sure | 99 |
| 5.11 It is a problem that the <i>health workers</i> DO NOT speak my language. | Agree | 1 |
| | Disagree | 0 |
| | Both agree and disagree | 2 |
| | Don't know / not sure | 99 |
| 5.12 I find it easy to tell the <i>health workers</i> when I have missed taking my tablets | Agree | 1 |
| | Disagree | 0 |
| | Both agree and disagree | 2 |
| | Don't know / not sure | 99 |
| | Not applicable | 98 |
| 5.13 The <i>health workers</i> are too busy to listen to my problems | Agree | 1 |
| | Disagree | 0 |
| | Both agree and disagree | 2 |
| | Don't know / not sure | 99 |

| | | | | |
|------|---|--|-----|------------------|
| 5.14 | Patient information is kept confidential in this clinic | Agree | 1 | |
| | | Disagree | 0 | |
| | | Both agree and disagree | 2 | |
| | | Don't know / not sure | 99 | |
| 5.15 | Some staff DO NOT treat patients with sufficient respect | Agree | 1 | |
| | | Disagree | 0 | |
| | | Both agree and disagree | 2 | |
| | | Don't know / not sure | 99 | |
| 5.16 | The health workers I see respect me | Agree | 1 | |
| | | Disagree | 0 | |
| | | Both agree and disagree | 2 | |
| | | Don't know / not sure | 99 | |
| 5.17 | The facilities (including waiting area and toilets) are dirty | Agree | 1 | |
| | | Disagree | 0 | |
| | | Both agree and disagree | 2 | |
| | | Don't know / not sure | 99 | |
| 5.18 | How satisfied were you with the service today? | Very satisfied/ Satisfied | 1 | |
| | | Neither satisfied nor dissatisfied | 2 | |
| | | Dissatisfied/ Very dissatisfied | 3 | |
| | | Don't know | 99 | |
| 5.19 | Since you first started coming to this facility, have you ever left without being helped? | Yes | 1 | |
| | | No | 0 | If no go to 5.21 |
| 5.20 | IF YES Can you explain what happened? | | | |
| 5.21 | Have you ever <u>not used</u> TB services when you needed them? | Yes | 1 | |
| | | No | 0 | If no go to 5.23 |
| 5.22 | IF YES Why did you not use TB services? Include all factors – personal and facility-related | | | |
| 5.23 | How do you think the service in this clinic could be improved? | Improvement | Yes | No |
| | | Shorter queues | 1 | 0 |
| | | More health workers | 1 | 0 |
| | | Cleaner facilities | 1 | 0 |
| | | Better patient facilities (toilets, waiting room area etc) | 1 | 0 |
| | | Don't know | | 99 |
| | | Other (specify) | | |

SECTION 6: DWELLING CHARACTERISTICS, HOUSEHOLD INCOME, EXPENDITURE AND HOUSEHOLD ASSETS

READ OUT: Finally, we want to ask you some questions about the characteristics of the house where you live and type of facilities available within your household

| | | |
|--|--|----|
| 6.1 Where do you live? | <div>village or community</div> <div>_____ area or township</div> | |
| 6.2 Which best describes the type of house in which you live? | House or brick structure on a separate stand or yard or on farm | 1 |
| | Traditional dwelling/hut/structure made of traditional materials | 2 |
| | Flat or apartment in block of flats | 3 |
| | Town/cluster/semi-detached house (simplex, duplex or triplex) | 4 |
| Clarify answer | Unit in retirement village | 5 |
| Tick one only | Dwelling/house/flat/room in backyard | 6 |
| | Informal dwelling/shack IN the backyard of a formal house | 7 |
| | Informal dwelling/shack NOT in backyard e.g. in an informal/squatter settlement or on farm | 8 |
| | Room/flatlet not in backyard but on a shared property e.g. granny flat | 9 |
| | Caravan/tent | 10 |
| | Worker's hostel | 11 |
| | Other (specify) | |
| 6.3 What is the main material of your house's walls? | Bricks & plaster/finished | 1 |
| | Bare brick/cement block | 2 |
| Clarify answer | Corrugated iron/zinc | 3 |
| Tick one only | Wood | 4 |
| | Plastic | 5 |
| | Cardboard | 6 |
| | Mixture of mud and cement | 7 |
| | Wattle and daub | 8 |
| | Mud | 9 |
| | Other (specify) | |
| 6.4 What is the main material of your house's roof? | Tiles | 1 |
| | Corrugated iron/zinc | 2 |
| Clarify answer | Thatching | 3 |
| Tick one only | Asbestos | 4 |
| | Plastic | 5 |
| | Cardboard | 6 |
| | Other (specify) | |

| | | |
|---|---|----|
| 6.5 How many rooms, including kitchens, does your house have? Interviewer, probe and exclude bathrooms, sheds, garages, stables, etc. from the total unless people are living in them | | |
| 6.6 What is the main source of drinking water for members of your household? Clarify answer Tick one only | Piped (tap) water in dwelling | 1 |
| | Piped (tap) water on site or in yard | 2 |
| | Borehole on site | 3 |
| | Rain water tank on site | 4 |
| | Neighbour's tap | 5 |
| | Public/communal tap (either free or paid) | 6 |
| | Water carrier/tanker | 7 |
| | Borehole off site/communal | 8 |
| | Flowing water/stream/river | 9 |
| | Stagnant water/dam/pool | 10 |
| | Well | 11 |
| | Spring | 12 |
| | Other (specify) | |
| | | |
| 6.7 What type of toilet does your household use? Clarify answer Tick one only | Flush toilet (connected to sewage) | 1 |
| | Flush toilet (with septic tank) | 2 |
| | Chemical toilet | 3 |
| | Pit latrine with ventilation pipe | 4 |
| | Pit latrine without ventilation pipe | 5 |
| | Bucket toilet | 6 |
| | No facility/bush/field | 7 |
| | Other (specify) | |
| 6.8 What is the main source of energy for cooking in your household? Clarify answer Tick one only | Electricity from mains | 1 |
| | Electricity from generator | 2 |
| | Gas | 3 |
| | Paraffin | 4 |
| | Wood | 5 |
| | Coal | 6 |
| | Animal dung | 7 |
| | Solar energy | 8 |
| | Other (specify) | |

| | | | |
|--|--|-----------------|----|
| 6.16 In general how much does your household usually spend in a month? If the respondent does not give you a precise estimate ask him/her In which of the following ranges, would you say your household EXPENDITURE generally falls? Tick one only | | Rand | |
| | | R0 – R399 | 1 |
| | | R400 – R799 | 2 |
| | | R800 – R1 199 | 3 |
| | | R1 200 - R1 799 | 4 |
| | | R1 800 - R2 499 | 5 |
| | | R2 500 - R4 999 | 6 |
| | | R5 000 - R9 999 | 7 |
| | | R10 000 or more | 8 |
| | | Don't know | 99 |
| | | Refuse | 97 |
| 6.17 Do you have anything else that you would like to tell us about your experience of seeking or receiving care at this facility? | | | |
| 6.18 Note the end time of the interview | | : am / pm | |

Thank the interviewee and indicate that you would now like to ask his/her permission to examine his/her TB record (card).

**RESEARCHING EQUITY IN ACCESS TO HEALTH CARE
RECORD REVIEW OF TUBERCULOSIS SERVICES:
CONSENT FORM**

Facility: *[enter name of facility]* _____

I have been informed about the project *Researching equity in access to health care*, and I understand that it is up to me whether or not to allow my medical record to be reviewed.

I understand that there will be no consequences of any kind through my agreement to this request; in particular, there will be no impact on the care that I receive in this clinic/hospital.

I understand that the information obtained from my patient medical record will be treated in the strictest confidence and that my name will not be used when the information is analysed.

Yes, I give my permission to review my record

☐

Interviewee's signature

Date

Interviewer's name (please print)

Interviewer's signature:

Date

RESEARCHING EQUITY IN ACCESS TO HEALTH CARE

RECORD REVIEW OF TUBERCULOSIS SERVICES

INSTRUCTIONS

- This record review must be completed for all the TB patients interviewed in the exit interviews.
- Information should be collected immediately after the interview by the team doing the interviews.
- Record the patient's personal details on this page. Stick the patient's study sticker on this page and also stick one on the front page of the actual data collection sheet.
- Use the patient's personal details to find their individual blue card in the TB section of the facility.
- Complete the data collection sheet using the patient's blue card.
- The completed questionnaire must be attached to the patient's exit interview.
- Once quality control has been completed this front page will be detached and kept separately.

Patient Details

Name of facility:

Patient name:

Clinic number:

Study sticker:

Record Review

INSTRUCTIONS

- Make sure that the patient's study sticker is attached below.
- Complete the information overleaf using the patient's blue card.
- The completed questionnaire must be attached to the patient's exit interview.
- Once quality control has been completed the front page will be detached and kept separately. This part of the questionnaire must remain with the completed exit interview.

Study sticker:

| |
|--|
| |
|--|

Completed by:

| |
|--|
| |
|--|

Date completed:

| | | | | | | | | | | | | | |
|---|---|--|--|---|---|---|--|--|---|---|---|---|---|
| d | D | | | / | m | m | | | / | y | y | y | y |
| | | | | | | | | | | | | | |

Blue card found?

| | |
|-----|----|
| Yes | No |
|-----|----|

Quality checked by:

| |
|--|
| |
|--|

A. RECORDING & REPORTING

The section is concerned with the general level of **completeness** of the blue card, that is whether or not all the required information has been filled in. Circle **Yes** or **No** to indicate if the following information is filled in on the card. Only circle **Yes** if ALL the required information is completed. Circle **No** if there is no information filled in or the information is incomplete or the information is not available on your version of the card.

Page 1 :

| | | |
|---|-----|----|
| 1. Registration number | Yes | No |
| 2. Registration date | Yes | No |
| 3. Patient origin (N, M or T ticked in upper right hand corner) | Yes | No |
| 4. Full names of patient | Yes | No |
| 5. Patient ID number | Yes | No |
| 6. Patient date of birth | Yes | No |
| 7. Patient age | Yes | No |
| 8. Patient gender | Yes | No |
| 9. Patient home and work addresses | Yes | No |
| 10. Address in sufficient detail to trace patient (Clear description if no formal address) | Yes | No |
| 11. Name and addresses of next of kin | Yes | No |
| 12. Patient category | Yes | No |
| 13. Disease classification | Yes | No |
| 14. Notification date | Yes | No |

Page 2 :

| | | |
|--|-----|----|
| 15. Pre-treatment sputum results | Yes | No |
| 16. Intensive phase regimen and dosage | Yes | No |
| 17. Continuation phase regimen and dosage | Yes | No |
| 18. Adherence section up to date (To 1 week ago if weekly Rx / To 1 month ago if monthly Rx) | Yes | No |
| 19. Name and contact details of treatment supervisor (For both phases on new form) | Yes | No |

Page 3 :

| | | |
|---|-----|----|
| 20. HIV status | Yes | No |
| 21. Clinical notes on patient progress | Yes | No |
| 22. Patient's weight recorded at each visit | Yes | No |

Page 4 :

| | | |
|---|-----|----|
| 23. Patient contact section filled in (No Contacts should be written if there were no contacts) | Yes | No |
| 24. Treatment outcome recorded | Yes | No |
| 25. Discharge date recorded for patients that completed treatment | Yes | No |

B. CLINICAL MANAGEMENT

The section is concerned with whether or not the completed information is **correct** and the patient has been managed **correctly**. For each question below simply copy the required information directly from the card. Note that not all answers may be appropriate or completed for your patient. If the information is not available please write **N/A** in the box or next to the question.

1. Version of the card (Date in top right corner Eg: Sep 2002 or Nov 2006)

| |
|--|
| |
|--|

2. Patient's registration date

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| d | d | / | m | m | / | y | y | y | y |
| | | | | | | | | | |

3. Patient's birth date

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| d | d | / | m | m | / | y | y | y | y |
| | | | | | | | | | |

4. Patient category

| | | | | | |
|---|----|-----|----|----|----|
| N | RC | RAC | RF | RD | OR |
|---|----|-----|----|----|----|

5. Classification of disease

| | | |
|--------------|------------|-----------------------------|
| Pulmonary TB | TB Primary | Extra PTB / Any other TB |
|--------------|------------|-----------------------------|

6. Patient has been notified? (Y ticked AND date recorded)

| | |
|-----|----|
| Yes | No |
|-----|----|

7. Record all the sputum test dates and results listed for the patient on the form:

| | | Smear Date | | | | | | | | Smear Result | | |
|------------------------------|------|------------|---|---|---|---|---|---|---|--------------|---|--|
| | | d | d | / | m | m | / | y | y | y | y | |
| Pre-Treatment | i. | | | / | | | / | | | | | |
| | ii. | | | / | | | / | | | | | |
| End of intensive phase | i. | | | / | | | / | | | | | |
| | ii. | | | / | | | / | | | | | |
| | iii. | | | / | | | / | | | | | |
| | iv. | | | / | | | / | | | | | |
| Discharge / End of treatment | i. | | | / | | | / | | | | | |
| | ii. | | | / | | | / | | | | | |

8. Record all the culture test dates and results listed for the patient on the form:

| | | Culture Date | | | | | | | | Culture Result | | |
|-----|--|--------------|---|---|---|---|---|---|---|----------------|---|--|
| | | d | d | / | m | m | / | y | y | y | y | |
| i. | | | | / | | | / | | | | | |
| ii. | | | | / | | | / | | | | | |

9. Drug Regimen

| | | |
|---|---|---|
| 1 | 2 | 3 |
|---|---|---|

10. Treatment start date

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| d | d | / | m | m | / | y | y | y | y |
| | | | | | | | | | |

11. Patient's weight at diagnosis

| | |
|--|----|
| | kg |
|--|----|

12. Drug dosage in INTENSIVE phase

| | | | | |
|--------------------------|------|-----|---|---|
| | RHZE | RHZ | S | E |
| Number of tablets / dose | | | | |

13. Drug dosage in CONTINUATION phase

| | | | | |
|--------------------------|-------------|--------------|------------|---|
| | RH (150/75) | RH (300/150) | RH (60/30) | E |
| Number of tablets / dose | | | | |

14. Number of visits missed. (Count the total number of Xs in calendar section on page 2 for each phase)

| | |
|--------------------|--|
| Intensive phase | |
| Continuation phase | |

15. Any patient contacts?

| | |
|-----|----|
| Yes | No |
|-----|----|

If YES, check contact tracing done correctly?

All children (< 5 years) had X-Ray AND Mantoux/tuberculin test

All adults (> 13 years) had sputum test

| | |
|-----|----|
| Yes | No |
| Yes | No |

16. Treatment outcome

| | |
|-----------------------------------|--|
| Not Recorded | |
| Patient transferred / Moved | |
| Cured | |
| Treatment completed | |
| Treatment defaulted / interrupted | |
| Treatment failure | |
| Died | |

17. Treatment outcome date

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| d | d | / | m | m | / | y | y | y | y |
| | | | | | | | | | |

Appendix C: Ethical approval of current research.



UNIVERSITY OF CAPE TOWN
Faculty of Health Sciences
Human Research Ethics Committee



Room ES3-46 Old Main Building
Groote Schuur Hospital
Observatory 7925
Telephone [021] 406 6626
Email: shuretta.thomas@uct.ac.za
Website: www.health.uct.ac.za/fhs/research/humanethics/forms

22 November 2018

HREC REF: 756/2018

A/Prof S Cleary
Health Economics Unit
Public Health & Family Medicine
Falmouth Building

Dear A/Prof Cleary

PROJECT TITLE: GENDER INEQUALITIES IN ACCESS TO TUBERCULOSIS SERVICES IN SOUTH AFRICA (Master's Candidate - Ms M Haji)

Thank you for submitting your study to the Faculty of Health Sciences Human Research Ethics Committee.

It is a pleasure to inform you that the HREC has **formally approved** the above-mentioned study.

Approval is granted for one year until the 30 November 2019.

Please submit a progress form, using the standardised Annual Report Form if the study continues beyond the approval period. Please submit a Standard Closure form if the study is completed within the approval period.

(Forms can be found on our website: www.health.uct.ac.za/fhs/research/humanethics/forms)

Please quote the HREC REF in all your correspondence.

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please note that for all studies approved by the HREC, the principal investigator **must** obtain appropriate Institutional approval, where necessary, before the research may occur.

The HREC acknowledge that the student, Mina Haji will also be involved in this study.

Yours sincerely

Signature Removed

PROFESSOR M BLOCKMAN
CHAIRPERSON, FHS HUMAN RESEARCH ETHICS COMMITTEE

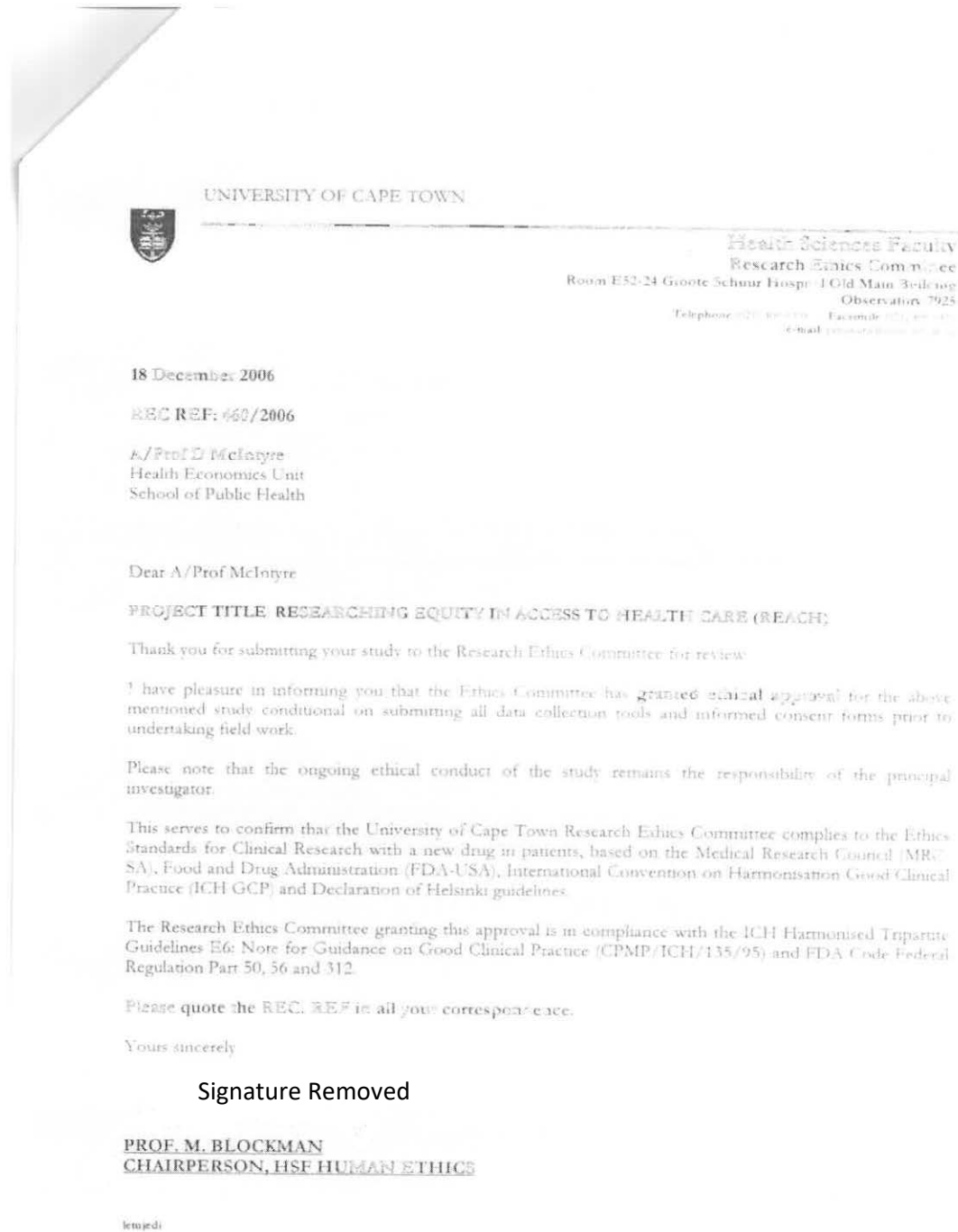
Federal Wide Assurance Number: FWA00001637.

Institutional Review Board (IRB) number: IRB00001938

This serves to confirm that the University of Cape Town Human Research Ethics Committee complies to the Ethics Standards for Clinical Research with a new drug in patients, based on the Medical

HREC 756/2018

Appendix D: Ethical approval of REACH research.





UNIVERSITY OF CAPE TOWN

**Health Sciences Faculty
Research Ethics Committee**
Room E52-24 Groote Schuur Hospital Old Main Building
Observatory 7925
Telephone (021) 406 6338 • Facsimile (021) 406 6471
e-mail: pecaward@curia.uct.ac.za

07 November 2007

REC REF: 460/2006

A/Prof D McIntyre
Health Economics Unit
School of Public Health

Dear A/Prof McIntyre

PROJECT TITLE: RESEARCHING EQUITY IN ACCESS TO HEALTH CARE (REACH)

Thank you for your letter to the Research Ethics Committee dated 26th October 2007.

It is a pleasure to inform you that the Ethics Committee has **granted ethical approval** to use the set of data gathering tools and information sheets and informed consent forms described in appendices 1-18.

Please could you address the following two concerns:

- Will patient-participants receive any compensation for taking part in the in-depth interviews (semi-structured and narratives)? These are long and may be burdensome for some patients.
- Do you intend to take any action should you observe harmful staff-patient interaction? You indicate that all observations will be strictly confidential which might pose an ethical dilemma should 'patient-abuse' be observed by researchers.

Please would you notify Dr Tracey Naledi in the Western Cape Department of Health that you are undertaking this study. You indicate that you already have provincial permission to do this research, so it may be a redundant exercise (I'll email you her latest requirements).

Please note that the ongoing ethical conduct of the study remains the responsibility of the principal investigator.

Please quote the REC. REF in all your correspondence.

Yours sincerely

Signature Removed

PROF M BLOCKMAN
CHAIRPERSON, HSF HUMAN ETHICS

lemjedi

Health Policy Journal

Introduction

Health Policy is intended to be a vehicle for the exploration and discussion of health policy issues and is aimed in particular at enhancing communication between health policy researchers, legislators, decision-makers and professionals concerned with developing, implementing, and analysing health policy in high-income countries primarily outside the US.

Health care policies and reforms are made at an ever-increasing pace in countries around the world- and policy-makers are increasingly looking to other countries for solutions to their own problems.

Health Policy is committed to support this international dialogue to ensure that policies are not just copied but used and adapted based on the specific problems and objectives as well as the respective context. Articles in Health Policy should thus describe and analyze

1. what is happening in terms of policies, reforms, regulation etc. of health systems;
2. where are the ideas coming from, i.e. are they "imported" from another country or are they developed within the country - and how innovative are they in comparison to what is happening in other countries;
3. why is it happening, e.g. as a consequence of a change in government, popular dissatisfaction, (perceived) unsustainable cost increases or an international requirement, and what are the objectives;
4. the actors involved (both governmental as well as non-governmental including scientists, the media and the public), what are their roles, their opinions and their strength in the decision and implementation process;
5. intended and, especially, unintended effects of these policies or reforms on the health system in terms of access, appropriateness, costs, effectiveness, quality, patient experience and equity etc.; and last but not least
6. their final consequences in terms of health outcomes, financial protection and responsiveness to the population's legitimate expectations, i.e. a performance assessment of reforms and health systems.

To achieve the journal's objectives, authors are encouraged to write in a non-technical style, which is understandable to health policy practitioners and specialists from other disciplines. The use of overly technical tables (e.g. full of regression models) or equations is discouraged or should be placed in the supplementary material.

Types of Contribution

Health Policy will be accepting submissions in three different formats:

(1) "Health reform monitor" of around 2,500 to 3,000 words (excluding abstract and references), concentrating on proposed, discussed, just passed and/ or implemented reforms in one of the Health Systems and Policy Monitor member countries. These do not have to present empirical data but analyze actors and processes. More information on Health Reform Monitor articles can be found [here](#).

(2) "Full-length articles" of around 4,000 words (excluding abstract and references and not more than 4,500 words), mainly empirical, analyzing the impact of health systems, reforms and policies - both in terms of intended and unintended effects. In addition, more theoretical, conceptual or methodological papers can be submitted.

(3) "Reviews/comparative analyses" of around 6,000 words (excluding abstract and references and not more than 7,000 words) can either be

(a) systematic reviews of health policy measures

(b) or examine certain aspects of health systems or health reforms in a systematic, comparative manner across a number of countries. Such papers may additionally include experience from countries outside the primary focus of the journal.

In all cases, Authors should provide sufficient background and context and discuss their findings in an international context, to ensure that their manuscript can be appreciated by an international readership.

Besides these three main types of submissions, Health Policy is interested in publishing debate among the readers in the form of letters and repliques as well as commissioned editorials.

For all types of submissions, the material should not have been previously published in peer-review journals elsewhere. Publication as an abstract, academic thesis or discussion paper is permissible but needs to be stated in the cover letter to the editor upon submission.

Size and Layout

Manuscripts should be written in English. They should be clear, concise and logical, and follow the suggested word length (see above) as well as the number of tables and figures (see below).

Manuscripts should be structured as follows (if appropriate; e.g. Health Reform Monitor articles may differ): • Cover letter • Title Page (incl. Acknowledgements, e.g. to sponsors, and Conflict of Interest statement) • Abstract • Introduction • Materials and methods • Results • Discussion • Conclusions (especially for policy-makers and international audience) • Appendices (will be included as online supplementary material if the manuscript is accepted).

There should be no footnotes or endnotes in the manuscript.

Manuscripts that do not comply with the above mentioned manuscript guidelines will be considered as non-admissible. All submissions will be checked for plagiarism. The handling editor will be informed about any incorrectly cited text passages/ findings of plagiarism.

Figures, tables and equations

Figures and tables are encouraged but should not be too technical. Technical tables and especially equations or other formulae should be avoided. Except in exceptional circumstances, the admissible number of figures and tables together is 2 for Health Reform Monitor articles, 4 for full-length articles and 6 for reviews and comparative articles. Additional figures and tables may be supplied as supplementary material. Figures and tables should still be legible when reduced in size for printing.

Essential title page information

- *Title.* Be concise and informative. Titles are often used in information-retrieval systems. Avoid abbreviations and formulae.
- *Author names and affiliations.* Where the family name may be ambiguous (e.g., a double name), please indicate this clearly. Present the authors' affiliation addresses (where the actual work was done) below the names. Indicate all affiliations with a lower-case superscript letter immediately after the author's name and in front of the appropriate address. Provide the full postal address of each affiliation, including the country name and, if available, the e-mail address of each author.
- *Corresponding author.* Clearly indicate who will handle correspondence at all stages of refereeing and publication, also post-publication. Ensure that phone numbers (with country and area code) are provided in addition to the e-mail address and the complete postal address. Contact details must be kept up to date by the corresponding author.
- *Present/permanent address.* If an author has moved since the work described in the article was done, or was visiting at the time, a 'Present address' (or 'Permanent address') may be indicated as a footnote to that author's name. The address at which the author actually did the work must be retained as the main, affiliation address. Superscript Arabic numerals are used for such footnotes.
- *Acknowledgements*
- *Conflict of Interest statement*

Abstract

An abstract of 200 words (and not more than 220) must be included in the submitted manuscript. As the abstract is often viewed separately from the article, it must be able to stand alone. It should state briefly and clearly the purpose and setting, the principal findings and major conclusions, and the paper's contribution to knowledge. If applicable, the country/countries/locations should be clearly stated, as should the methods and nature of the sample, the dates, and a summary of the findings/ conclusion. Please note that excessive statistical details should be avoided, abbreviations/acronyms used only if essential or firmly established, and the abstract should not contain references to other published work.

Classification and keywords

Authors are asked to classify their submission using the provided classification system. They are also asked to include 3 to 6 keywords, preferably from the Medical Subject Headings from *Index Medicus*.

Formatting of funding sources

List funding sources in this standard way to facilitate compliance to funder's requirements: Funding: This work was supported by the National Institutes of Health [grant numbers xxxx, yyyy]; the Bill & Melinda Gates Foundation, Seattle, WA [grant number zzzz]; and the United States Institutes of Peace [grant number aaaa].

It is not necessary to include detailed descriptions on the program or type of grants and awards. When funding is from a block grant or other resources available to a university, college, or other research institution, submit the name of the institute or organization that provided the funding.

If no funding has been provided for the research, please include the following sentence:

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Artwork

Electronic Artwork (Figures)

General points

- Make sure you use uniform lettering and sizing of your original artwork.
- Embed the used fonts if the application provides that option.
- Aim to use the following fonts in your illustrations: Arial, Courier, Times New Roman, Symbol, or use fonts that look similar.
- Number the illustrations according to their sequence in the text.
- Use a logical naming convention for your artwork files.
- Provide captions to illustrations separately.
- Size the illustrations close to the desired dimensions of the printed version.
- Submit each illustration as a separate file.

A detailed guide on electronic artwork is available on our website:

<https://www.elsevier.com/artworkinstructions>

Figure captions

Ensure that each illustration has a caption. Supply captions separately, not attached to the figure. A caption should comprise a brief title (**not** on the figure itself) and a description of the illustration. Keep text in the illustrations themselves to a minimum but explain all symbols and abbreviations used.

Tables

Number tables consecutively in accordance with their appearance in the text. Place footnotes to tables below the table body and indicate them with superscript lowercase letters. Avoid vertical

rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

Throughout the manuscript text, Authors must indicate where approximately the figures and tables should be included.

References

Citation in text

Please ensure that every reference cited in the text is also present in the reference list (and vice versa). Any references cited in the abstract must be given in full. Unpublished results and personal communications are not recommended in the reference list, but may be mentioned in the text. If these references are included in the reference list, they should follow the standard reference style of the journal and should include a substitution of the publication date with either 'Unpublished results' or 'Personal communication'. Citation of a reference as 'in press' implies that the item has been accepted for publication.

Reference formatting

There are no strict requirements on reference formatting at submission. References can be in any style or format as long as the style is consistent. Where applicable, author(s) name(s), journal title/book title, chapter title/article title, year of publication, volume number/book chapter and the pagination must be present. Use of DOI is highly encouraged. The reference style used by the journal is VANCOUVER NUMBERED and will be applied to the accepted article by Elsevier at the proof stage.

Reference style

Text: Indicate references by number(s) in square brackets in line with the text. The actual authors can be referred to, but the reference number(s) must always be given.

List: Number the references (numbers in square brackets) in the list in the order in which they appear in the text.